TERMODİNAMİK®

HEATING SYSTEMS

EKY/B 20 - 60

SOLID FUEL HOT WATER BOILER

INSTALLATION AND USAGE MANUAL

(20 kW - 60kW)

TD Group

TERMODİNAMİK ŞİRKETLER GRUBU

FOREWORD

Dear Customer;

First of all, thank you for choosing our product. We hope you will get complete satisfaction from EKY/B Natural Draft Solid Fuel Boiler.
We would like you to use your device with maximum efficiency, therefore please read this instruction book carefully before you start using the product and save it to refer to in the future.
This manual will help you to operate your device safely and efficiently. For this reason you should pay attention to these:

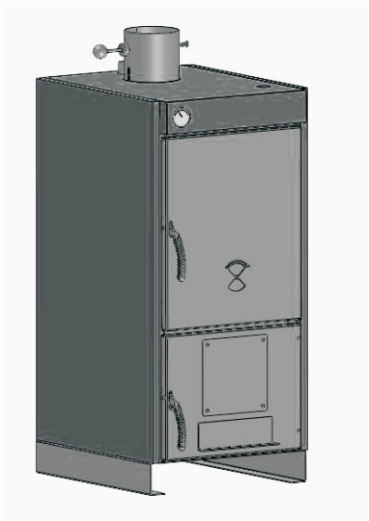
- *Please read this instruction book carefully before you install and operate the product.*
- *Follow the instructions and the rules on safe usage.*
- *The instruction book may apply to other models as well; the differences between the models are clearly described inside.*

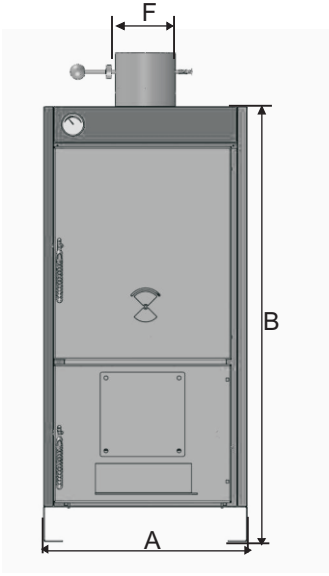
TERMODİNAMİK®

HEATING SYSTEMS

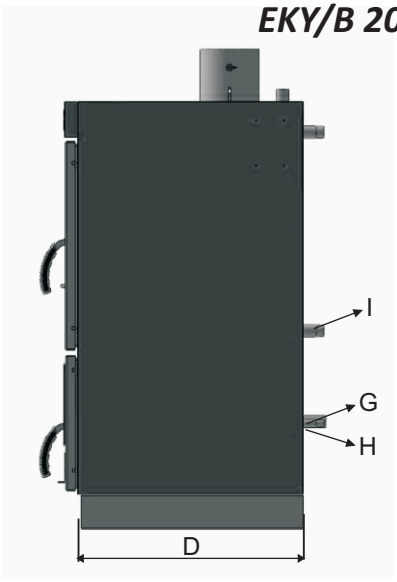
CONTENT

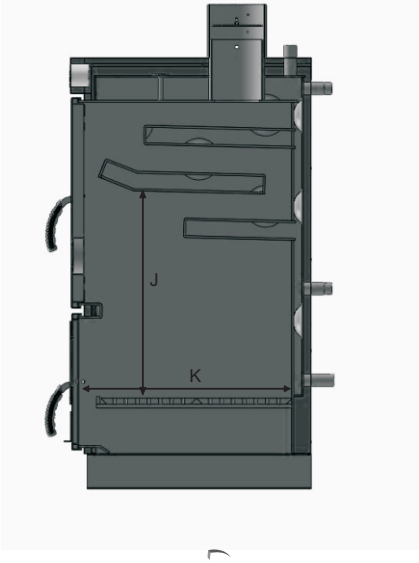
EKY/B 20-60 TECHNICAL SPECIFICATION





EKY/B 20-60 SIDE VIEW





EKY/B 20-60 TECHNICAL SPECIFICATION

Model	Capacity (Coal) Kw	Operating Pressure (bar)	Test Pressure (bar)	Water Volume (L)	Weight kg	Fuel Loading Lid Dimensions (mm)	J GRILLE HEIGHT (mm)	K GRILLE DEPTH (mm)
EKY/B 20	20	3	4,5	60	235	394x330	425	500
EKY/B 30	30	3	4,5	75	280	394x330	425	640
EKY/B 40	40	3	4,5	85	320	394x460	530	700
EKY/B 50	50	3	4,5	100	350	394x460	530	840
EKY/B 60	60	3	4,5	115	390	394x440	510	970

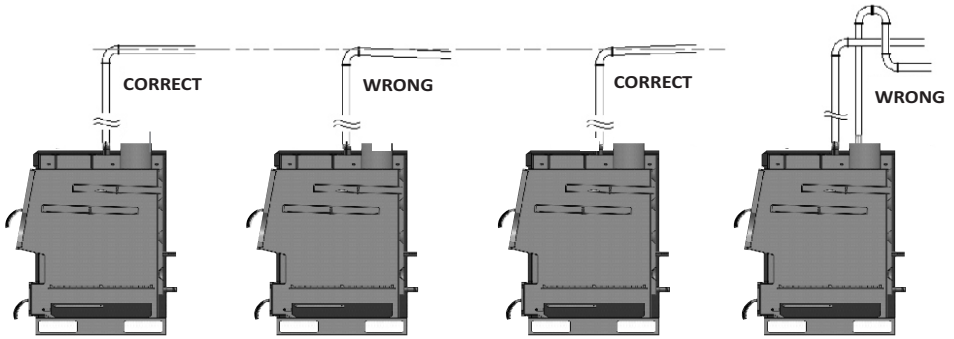
Model	A (mm)	B (mm)	D (mm)	F Flue Diameter (mm)	G (Boiler Inlet-Outlet)	H (Boiler Filling-Discharge)	I (Safety Input-Output)
EKY/B 20	530	1135	590	158	**R 1 1/4"**	R 1/2″	R 3/4″
EKY/B 30	530	1135	730	158	**R 1 1/4"**	R 1/2″	R 3/4″
EKY/B 40	530	1285	790	158	**R 1 1/4"**	R 1/2″	R 3/4″
EKY/B 50	530	1285	930	158	**R 1 1/4"**	R 1/2″	R 3/4″
EKY/B 60	530	1285	1060	158	**R 1 1/4"**	R 1/2″	R 3/4″

APPLIANCE INFORMATION

EKY/B series boilers are designed to burn different types of fuels such as wood, walnut coal, quince coal and low-calorie brown coal in ranging capacities. As it is known, the shaft gasses which occur as a result of burning wood and coal, and condensation of water vapors shall take place. Make sure not to operate the boiler below 45°C. In case of operation below 45°C, the temperature of the shaft will be low and this will cause the shaft draft to be insufficient and result in condensation. Therefore, the life span of the boiler shall be shorter due to corrosion in short time. This is designed to prevent the substantial decrease in the boiler outlet water temperature and acid drop (sulfuric acid) resulting from condensation by means of cooling the firebox.
In order to increase the combustiom efficiency adjust the placement of the air supply window om the upper door of the boiler.

ASSEMBLY INSTRUCTIONS

- The boiler should be leveled and installed at least at a distance of 20 cm from ground in boiler rooms on a durable surface.
- The boiler room should be regularly ventilated according to regulations and rule.
- When assembling EKY/B series boilers, it is required to use open expansion tank. The expansion tank should be located at the top of the installation and the safety pipes should be connected to the inputs and outputs of the boiler in the shortest route possible. There should never be any flow control units (valve, check valve, etc.) over the safety pipes. Make sure that the open expansion tank is always full. The expansion tank volumes suitable for each boiler are given in the table (at the page 5).



- In order to provide for the safety of the boiler and the assembly in case of power outages, the installation should have a by-pass line.
- Make sure to use a suitable check valve for all solid-fuel boilers and the pressure of the check valve should be equal to the maximum operating pressure of the boiler. On boilers operating with 3 bar working pressure 3-bar safety valves should be used.
- In regions prone to risk of freezing, expansion tank and insulation should be used.
- The diameter of the shaft should not be smaller than the output diameter of the boiler shaft and the instructions on the shaft assembly specified in this manual should be followed.
- During the installation of the appliance, make sure to leave some space around the appliance depending on the properties of the appliance enough for the technical service to handle the appliance.
- Make sure the location where the appliance and the waste gas disposal line are situated is not a living space.
- In order to minimize the heat loss, the installation pipes should be heat-insulated.
- Connectors and valves should be placed on inlet and outlet lines.
- Expansion tank flow and return pipes should be installed with continuous upward inclination from the boiler to the tank without any downward bending.
- The boiler should be connected to the chimney of the building without narrowing the diameter at the flue outlet and through pipes having minimum the same or larger diameter at the flue outlet and through pipes having minimum the same or larger diameter as the boiler flue outlet.

For installation of the boiler warning points indicated in the user manual must be taken into consideration. The supplier will not take any responsibility for wrong installation of the boiler and chimney.

EXPANSION TANK SELECTION

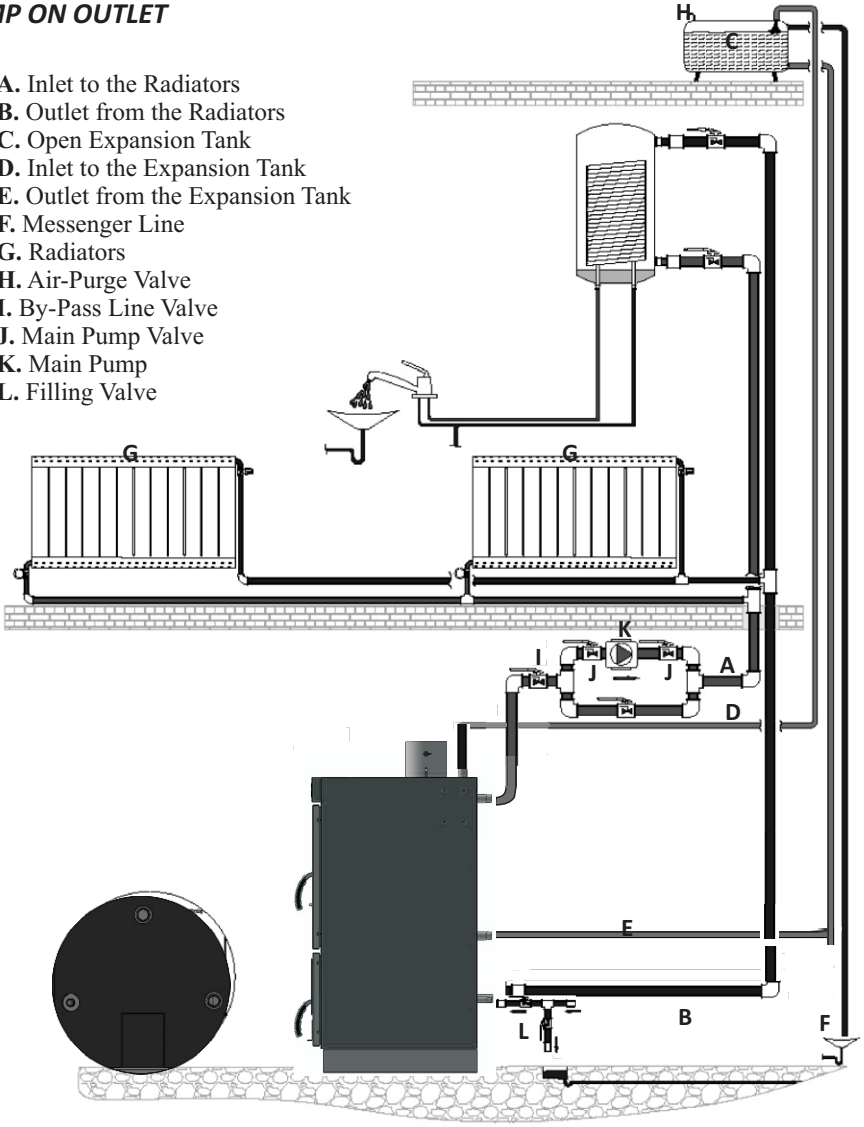
Boiler Capacity (kW)	Boiler Capacity (Kcal/h)	If Cast Sectional Heating Radiators are used	If Panel Radiators are used
20	17.000	45 L	26 L
30	25.800	65 L	42 L
40	34.400	87 L	58 L
50	43.000	108 L	72 L
60	51.600	129.6 L	86.4 L

The values given above are intended for nominal conditions. The contractor company shall perform the precise evaluation and calculations depending on the location and operation conditions of the boiler.

EKY-B 20-60 INSTALLATION CHART

PUMP ON OUTLET

A. Inlet to the Radiators
B. Outlet from the Radiators
C. Open Expansion Tank
D. Inlet to the Expansion Tank
E. Outlet from the Expansion Tank
F. Messenger Line
G. Radiators
H. Air-Purge Valve
I. By-Pass Line Valve
J. Main Pump Valve
K. Main Pump
L. Filling Valve



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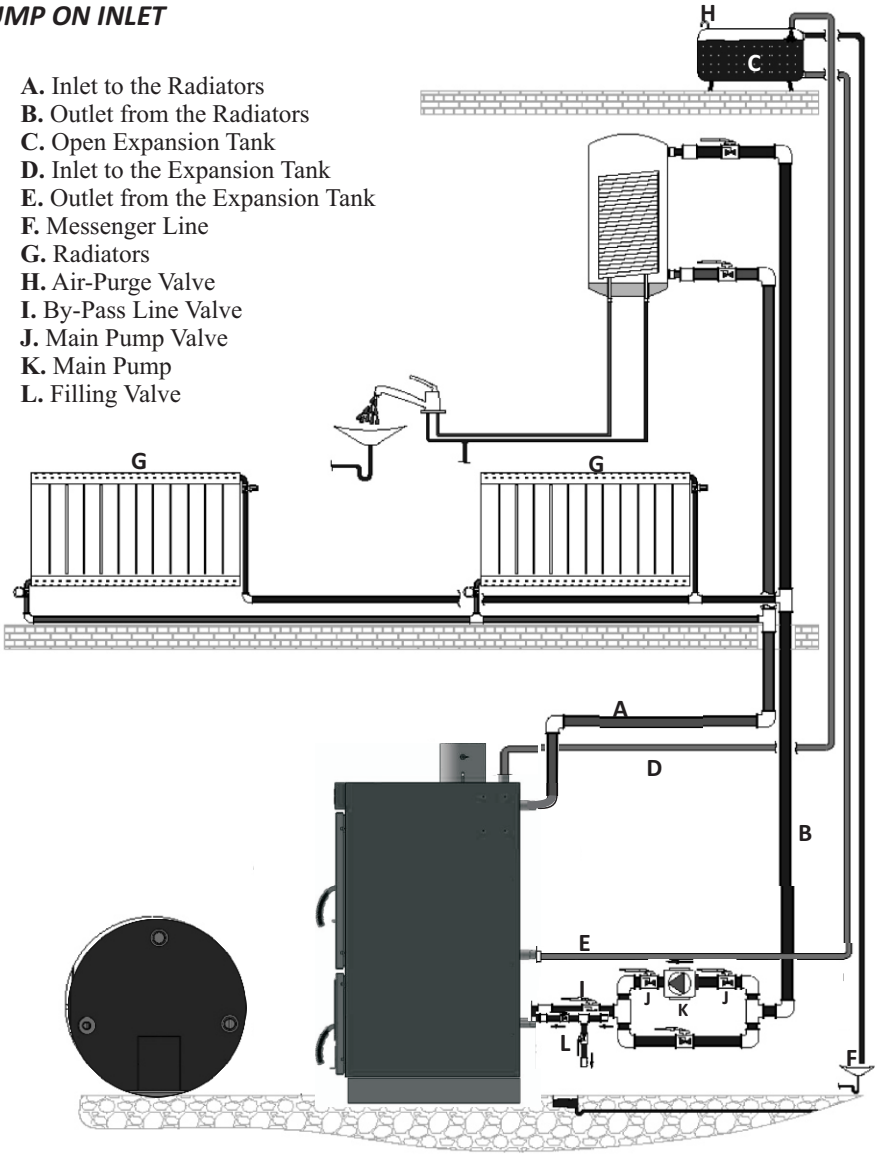
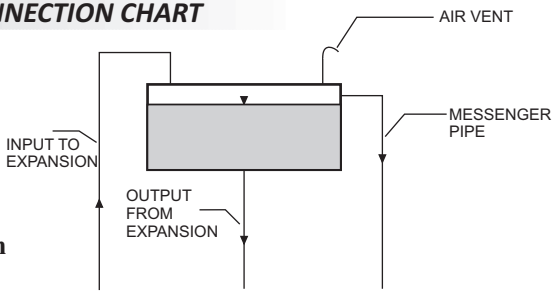
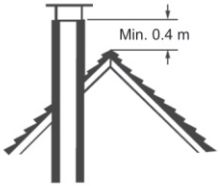


EKY/B 20-60 EXPANSION TANK CONNECTION CHART

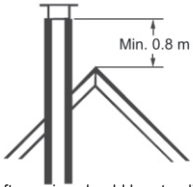


- These are containers open to atmosphere and they should be installed a distance from the top of the pipe system for hot water systems or at a distance from the radiator level at the top.
- **For the manual feeding boiler, open expansion tank must be used.**
- In places where the weather is very cold or there is risk of freezing, the expansion tank, expansion input and output pipes should be insulated.
- The input pipes connecting to the expansion tank should be assembled without turning downwards and should steadily level up when going from the boiler to the expansion tank.
- A hydrometer should be installed to the assembly in order to control the water level of the system.
- Make sure not to install units like valves, filters, check valve, etc. over the safety pipes between the expansion tank and the boiler.
- When water comes out of the messenger pipe, it means that the expansion tank is full and the boiler has reached a specific pressure level. This should be checked at times when water is pumped to the boiler from the main water supply.

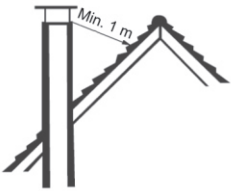
POSTURE OF THE SHAFT ON THE ROOF



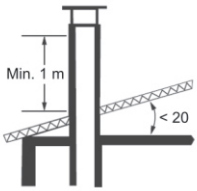
The shaft opening should be at a distance from the roof ridge for slant tiled roofs.



The shaft opening should be at a distance from of at least 80 cm from the roof ridge for slant roofs.



The shaft opening at a distance from the roof ridge (only tiled roofs).

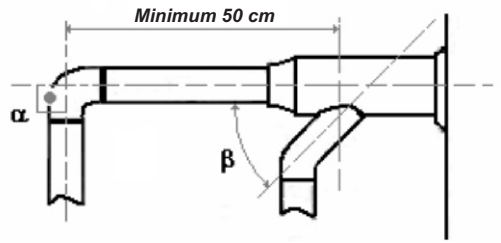


Roofs with little slant.

CHIMNEY

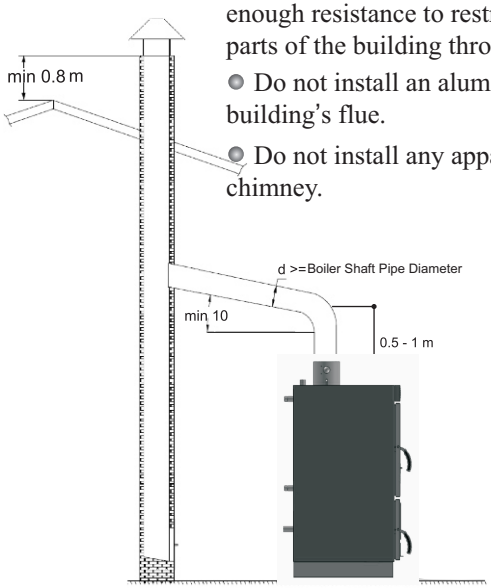
Connecting two solid fuel boilers to the same chimney is not recommended. Where this is not achievable and if calculations based to chimney cross section and height also allow using of other solid fuel boilers, then it is possible to connect multiple boilers into a common flue system. In such cases the configuration indicated in the figure should be considered.

Another point to be observed is that, the angle of the flue connection with horizontal axis of the second boiler to be connected should be less than the first one. The second boiler's flue connection to main flue connection should be in "swept connection" as shown in the picture.



Keep easily flammable materials away from boiler flue connections and hot areas, which may occur around the boiler.

- Shaft is one of the most important units of the system. When the shaft is not high-quality, the burning is not sufficient and no efficiency is obtained. And this results in smoking and soot.
- Fire proof metarial must be used for flue pipe and chimney should have enough resistance to restrain the fire outside the chimney into the other parts of the building through the chimney for certain time.
- Do not install an aluminium folding pipe between boiler's and building's flue.
- Do not install any apparatus such as windrose/weathercock at outlet of chimney.



- Shaft pipes should be connected to the shaft in a way having the same diameter with the boiler shaft output as much as possible.
- In order to intensify the shaft draft, do not install shaft extractor hoods, fans, etc. to the output of the shaft.
- Make sure not to use bendy pipes at the distance where the pipes shall be installed to the shaft from the shaft output of the boiler.

- If the shaft is made of iron sheet material, insulate the surrounding of the shaft and prevent the heat loss.
- The shaft should not have a sectional narrowness at any spot.
- Make sure not to install another appliance or more than one boiler to the same shaft.
- The boiler should not be installed to the shaft at a reverse angle preventing draught (see page 16).
- The shaft should be periodically cleaned not allowing for the formation of tarry soot inside which makes it impossible to clean the shaft.
- The flue pipe (chimney) mustn'tbe mounted with level which prevent the drought of it.
- End of the chimney must be 40 cm higher than tip of the roof.
- Chimney should be well insulated and heat losses should be reduced. When the chimney cools down the draught also decreases and in the cooled chimney the formed acids combined with the effect of condensation can lead corrosion on the inner surfaces of the chimney or down inside the boiler, therefore chimneys should also be insulated.

OPERATION OF THE BOILER:

1. Fully open the shaft valve before operating the boiler.

2. Make sure that the system is full of water and the air in the system is removed before operation. The system should be slowly supplied with water to prevent air formation in the system.

3. The system should be supplied with water until water comes out of the messenger pipe for the systems with open expansion tank.

4. After the system is filled with water, the system should be removed from air and it should be inspected for any possible leakages.

5. In the systems with open expansion tank, the base pressure level on the hydrometer should be marked.

6. The user of the boiler should be informed on the boiler settings, operation of the boiler and what to do in case of emergencies.

7. Place the fuel on the sieves as shown in the burning instructions which is provided with the boiler. Place igniting materials such as pieces of wood, firewood, etc. on the fuel to light it manually and close the feeding lid. After it catches fire, close the lower lid and turn adjust the air supply window on the upper door of the boiler.

8. Note that the quality of the fuel you shall use shall directly affect the efficiency of the boiler, quality of the burning, amount of ashes and cleaning periods and the amount of bunt coal. Therefore, we recommend you to buy some amount of sample fuel to check the performance of the coal before purchasing large amounts.

9. The lever located near the boiler, which allows for the movement of the sieve, allows for the ashes accumulated on the sieve to fall down. Thus, the contact of the air with fuel is minimized and the burning quality increases

10. Do not use high-calorie brown coals in the boiler. This may cause the sieves to melt and damage the firebox sheet.

11. For the boiler to have a long life span and for its durability, the water used should have the nominal hardness.

12. Do not operate the boiler without water and regularly control the level of water.

13. When the boiler is operating, do not touch the hot spots with bare hands (smoke box, front lid and interior parts of the boiler). Use protective equipments.

14. Do not open the covers of the smoke box when the boiler is operating.

15. Perform the periodical cleanings. Such cleanings shall allow you to obtain efficient and

proper burning from your boiler.

16. If you observe an abnormal condition regarding the boiler, take the necessary precautions immediately and contact our authorized services.

17. After the initial ignition of the boiler, the temperature of the boiler water must reach temperature of 60°C. As soon as the temperature has been reached, set the thermostat's value as 60°C to open the air supply window for 2 mm. Further control of the air supply window will be done mechanically in respect with the settings of the thermostat.

18. In order to set the highest value of the temperature, use the thermostat.

In order to benefit from the maximum efficiency of the boilers, regulate the air supply window on the upper door of the boiler.

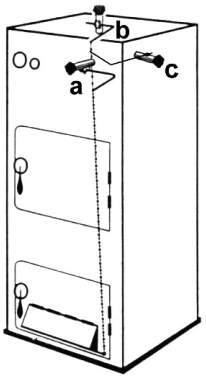
19. Pay attention to the structure of the smoke pipe in order to benefit from the maximum efficiency of the boiler.

20. Do not leave the boiler unattended for a long time, since it's required to change the settings of the thermostat regularly.

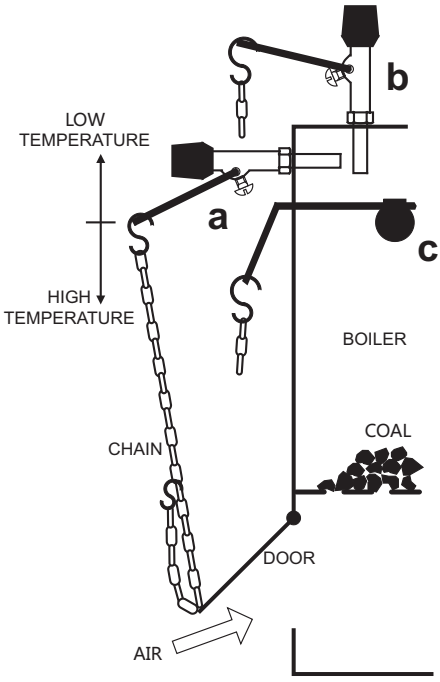
You should contact Termodinamik Company for appliance fuel conversion. You should be informed by the Company on the conditions of conversion and the procedure to be followed.

- Boiler must be operated according to the operation instructions.
- Open expansion tank must be used for EKY/B boilers.
- Hydrometer must be installed to an easly visible location.
- The Company cannot be held liable if the boiler consumes too much fuel in case the boiler is not used according to the user and maintenance manual provided with the boiler or the desired comfort temperature is not reached, of heat loss due to the heated area and of low calorific value of the fuel that is being used.
- Inside of the boiler any petrolium metarials (such as styrofoam, nylon, cloth etc...) which will cause pitch, should not be burned.
- Gas tightness of the chimney must be ensured.
- Smooth surfaces should be used as far as possible in order to reduce friction on the inside surfaces of the chimney.

DRAFT REGULATOR INSTALLATION



Regulator installation:
Screw the regulator with its 3/4" outer thread into the boiler socket with 3/4" inner thread. Seal the thread (e.g. with Siseal sealant, Teflon tape…). Turn the regulator so that for horizontal installation (a) the protrusion for bar placing pinpoints downwards, for vertical installation (b) it pinpoints to the front and for horizontal side installation (c) it pinpoints upwards.
Remove the plastic transport tube and insert the hole-free end of the hexagonal lever in itsplace. Tighten the screw in order to fix the lever in such a position that its free end is above the fixture on the boiler door and the lever is as close to the horizontal position as possible (as much the hexagon allows).



Attach the chain to the lever opening by means of the bigger hook fixed to the chain. Pass the other chain end through the fixture on the boiler door and fix this free end on the hanging chain. Check if the chain is hanging freely and the lever moves freely (when turning the knob).
If the regulator is installed in the (**a**) position, the white scale applies. For installations in the (**b**) and (**c**) positions, the red scale applies.

Regulator calibration:
Fire the boiler with door manually open. Set the regulator knob to 60. When the water temperature reaches 60 °C, let it stabilize for a couple minutes and then adjust the chain fixture so that the door gap is about 1-2 mm. Now you can select the desired temperature. If the real boiler temperature was lower during stable operation than set, shorten the chain, if the real temperature was higher than set,extend the chain. Please take into account also other factors that could influence the temperature inside the boiler disregarded of the regulator - esp. the quantity of fuel and ashes inside the boiler, position of the secondary-air damper, thermal lag of the boiler and of the whole heating plant.

BOILER WATER PROPERTIES

In order to prevent calcification of water inside of the boiler and pipes, not so hard water should be used. (The water used in system must be over FS 25 which is international standarts for water hardness.)

Parameter	Unit	Boiler Feeding Water	Boiler Filling Water
Appearance	–	Clean, clear. There are solid materials and stabile foam in it.	
Conductibility at 25°C iletkenlik	µS/cm	< 1500	
pH value at 25°C	–	> 7,0	From 9,0 115[a]
Total hardness (Ca+Mg)	mmol/l	< 0,05	
Iron concentration	mg/l	< 0,2	
Compound alkaline value	mmol/l	–	< 5
Diesel/oil concentration	mg/l	< 1	–
Organic particles	–	See the footnote[b]	

TS EN 12953-10 Boilers: Properties of boiler and feeding water as per the Feeding and Boiler Water Quality

a *If there are units made of materials other than steel found in the heating system (copper pipes, aluminum radiators, etc.), they may require lower pH values and conductivity. However, the protection of the boiler is primary in the system and the abovementioned values should be followed.*

b *Organic materials are generally formed by several compounds. It is hard to specify before the effects of such compounds and their each component on the boiler. Organic compounds may decompose and may form carbonic acid and other acidic compounds ad these may cause corrosion and punctures in the boiler. This may cause the formation of materials such as limestone and foaming which should be experienced at the minimum level.*

- It should be considered that waters with high level of hardness shall cause calcification. The malfunctions and low performance due to calcification are not covered in the warranty.
- The problems resulting from the use of the appliance for the purposes not intended for use (industrial use, etc.) are not covered by the warranty.
- The appliance is not covered by the warranty if types of water other than potable water are used in the boiler (artesian water, waste water, etc.).

CLEANING AND MAINTENANCE

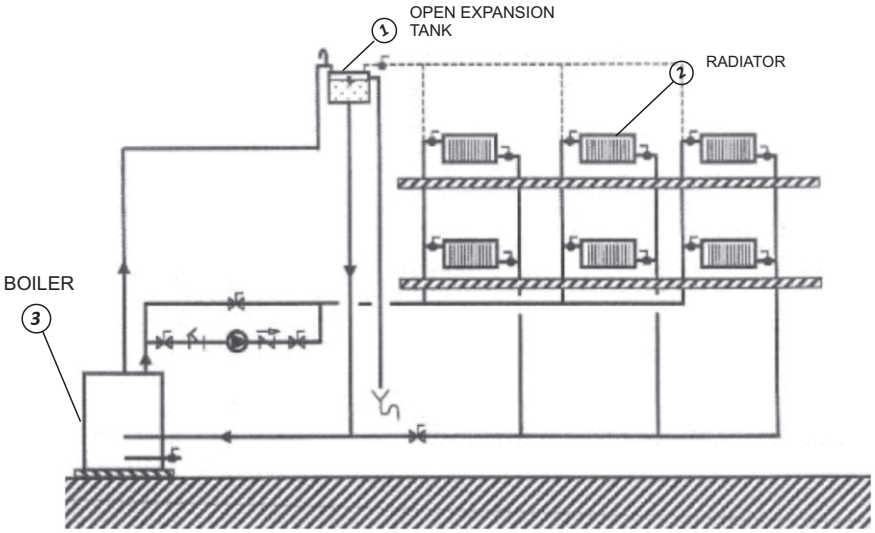
- In order to obtain efficient burning from the boiler and allow the boiler operate efficiently, the ashes accumulated on the sieves should be periodically let down by means of moving the ashes with the help of sieve discharge lever before adding fuel to the boiler for prismatic boilers.

- When the flames become glowing in the cylindrical boilers, the fuel should be added to the boiler after the ashes among the glows are let down with the help of fire rake. This way, the ashes preventing the burning air shall be removed from the sieve.

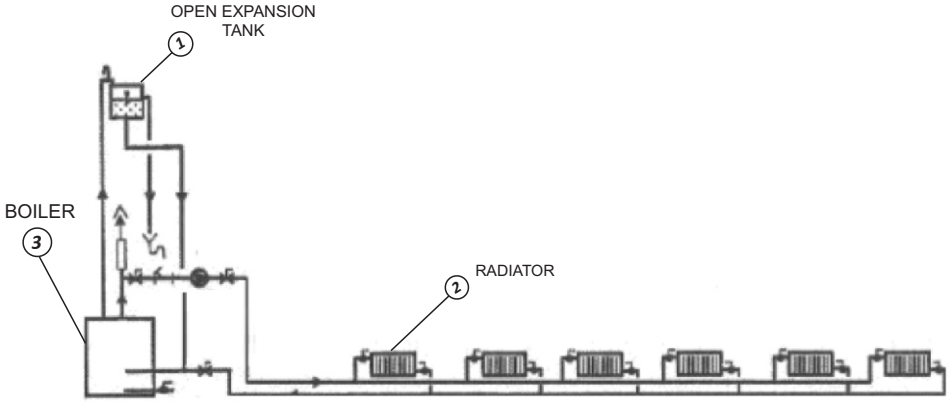
For a more efficient burning, regularly clean the ash sieve. Also;

- Check the water level in the boiler before each operation.
- The boiler should be operated as per the burning instructions and the flame in the burning chamber should be controlled and full burning should be provided.
- Smoke pipes, the turbulators inside the smoke pipes and the smoke box where the boiler is connected to the shaft should be cleaned at least once a week.
- Clean the shaft at least 3 times in a season.
- Clean the ashes accumulating in the shaft daily. You may want to perform the cleaning two times a day depending on the quality of the coal used (ash rate).
- Make sure that dust and burning coals do not fall onto the electrical equipments of the boiler and the fan.
- Do not clean the boiler when it is operating.
- You are recommended to get your boiler maintained and controlled (paid) by the TERMODINAMIK AUTHORIZED SERVICE before the winter.

RADIATOR INSTALLATION CHART FOR MULTIPLE-STORE BUILDINGS



ROOM HEATER INSTALLATION CHART



MALFUNCTIONS AND TROUBLESHOOTING

PROBLEM	REASON	SOLUTION
Inefficient burning in the burning chamber.	- Inefficient draught - Low-calorie or non-quality fuel - Improper draft regulator settings	- Calibrate the draft regulator - Clean the boiler. - Use high-quality and dry fuel.

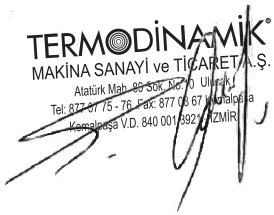
PRODUCER INFORMATION

PRODUCER

TITLE	:	**TERMODİNAMİK MAKİNA SANAYİ TİC.A.Ş.**
ADRESS	:	Kemalpaşa OSB Mah. 80. Sokak No:10 KEMALPAŞA-İZMİR-TURKEY
PHONE	:	+90 (232) 877 12 12
FAX	:	+90 (232) 877 08 67

COMPANY EXECUTIVE

SIGN - SEAL :



PRODUCT

TYPE OF PRODUCT	:	SOLID FUEL BOILER / NATURAL DRAFT
MARK	:	TERMODİNAMİK
MODEL	:	**EKY/B**
BANDEROLE AND SERIAL NUMBER:		
DATE AND PLACE OF DELIVERY	:	

SELLER COMPANY

TITLE	:
ADRESS	:
PHONE AND FAX	:
INVOICE DATE AND NUMBER	:
DATE - SIGN - SEAL	:

TERMODİNAMİK®

HEATING SYSTEMS

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