

## 20-25-35 MK

Installation Operation and Maintenance Instruction

-ECONOMIC -FULL AUTOMATIC -ELECTROCNIC IGNITION -FULL SAFE -WIDESPREAD SERVICE NETWORK **MAKTEK** Boiler has a high efficiency construction and provides economy by burning fuel fully. The burner used in MAKTEK Boiler, is a high-quality burner with superior technology. It provides high efficiency combustion, which provides the fuel air mixture at optimum concentration.

#### **GENERAL WARNINGS AND RECOMMENDATIONS**

The points to be followed by the user during oprating and maintenance are explained in this manual.

The following suggestions and warnings must be cared in terms of safety and efficiency of the system.

#### POINTS TO BE CONSIDER BY USERS

1- Receive your boiler in operative condition together with your installer system

2- Put your boiler in places where the plumber is suggests.

3- The boiler capacity is in 20.000 Kcal heating power, and heating more or less is linked to the amount of radiator to be selected. In this regard, consider the suggestions of your plumber.
4- Prepare the chimney, chimney connection, water, fuel and electricity connection when the

central heating system is installed. Take care that the chimney connection is at the shortest distance.

5- In the summer months when the boiler is not used, run the boiler at least once a month for 1-2 minutes. This will remove the chance of the circulation pump becoming trapped in the winter.

#### A. OPERATION OF THE BOILER

1-Check hydrometer to see if the expansion is filled with water. Do this check at any time during the working period.

2- Check the fuel tank if it is full with diesel fuel. Do not use the fuel in the tank until if finishes for fuel line not to make air.

3- Set your thermostat at the desired temperature (for ex. 50°- 60°-80°)

4- Check that the valve on the fuel line or at the fuel tank outlet if it is open.

5- Run your device by pressing the main control button (on the fron conrol panel )to ON position.

#### **USE OF PROGRAM CLOCK**

If the device has a program clock for programming,

a) Set the clock by turning it manually in the direction of the arrow on the watch dial.

b) There are small program bars around the dial that correspond to 15 minutes periaods each. When you want boiler to run, the boiler will automatically starts after pulling the bars that are across the preffered time period.

After adjusting the temperature to the desired temperature, press the main control button to make the device run.

#### INSTRUCTIONS FOR USE AND OPERATION OF BOILER WITH HOT WATER

1-In summer use, the boiler must only be operated for hot water. Selector switch position

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on the electric panel must be placed at mode. 2- MAKTEK Cenrtal Heating Boiler with Hot Water automatically starts to produce hot water.

Shortly after the boiler starts running , hot water is given by opening any hot water tap. 3- In the summer months, the boiler works only for hot water. Thermostat should be set to show the boiler thermometer 80°.

#### MAINTENANCE OF THE DEVICE

The burner in the MAKTEK Central Heating Boiler has a feature that can be easily removed and installed and the maintenance can be practically done.

1- The burner can be easily removed by loosening the two imbus screws on the aluminum flange. The electrical connection of the burner can be removed by removing the socket on the burner and removing it from the device. 2- It is enough to remove the burner barrel to reach the part of the burner taht containes the turbulator, the injector and the electrodes.



3- Dismantling of burner electrodes, injectors and turbulators:

First, the cable headers with socket are removed from the double electrode. Then the screw holding the turbulator is loosened and turbulator demounted from its place. The electrode holder screw is demounted and electrode is removed from its place. The injector can be removed by means of a key. The replacement of these elements is carried out by reversing the same order.



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- 1- Ignition Transformer
- 2- Photocell
- 3- Condenser
- 4- Burner Engine
- 5- Fuel Pump
- 6- Solenoid
- 7- Brain

\* The device is secured by pressure prosestat. Device will not enter the circuit unless sufficiant close- circuit pressure is provided.

#### **B. GENERAL USAGE RULES**

1- Switch off your device when you are filling the depot with diesel and wait for 1 hour without working.

2- Before restarting the unit, drain the sediment and water that accumulate on the bottom of the boiler by opening draining valve.

3- Clean the diesel filters at the outlet of the tank every 30 days. After the filter is cleaned, drain the air of the circuit.

4- Clean the electrodes and the turbulator of the burner every 6 days with a dry cloth.

- 5- Clean it with a photocell every 60 days.
- 6- At the beginning of each winter season, clean the soot has accumulated in the boiler.

7- Clean the burner nozzle every 4 months.

Note: It is recommended that the maintenance procedures specified in items 4, 5, 6 and 7 are carried out by your authorized service.

#### **BURNER DIESEL FILTER CLEANING**

- 1-Stop running of device.
- 2- Close the outlet valve in the diesel reservoir.
- 3- Remove the strainer wire in the filter and wash thoroughly with clean diesel and replace.
- 4- Screw the filter cover in its place.
- 5- Open the tank outlet valve.

6- Loosen the bleed plug of the pump and allow burner to run. When the diesel comes out of the tap, tighten again.

7- Dry the filter with a cloth and check for leaks.

#### PHOTOCELL CLEANING

- 1- Stop running of device.
- 2- Remove photocell by pulling it to the back side.
- 3- Clean the glass part of the photo-cell with a clean, dry cloth and replace it.

#### SOOT CLEANING

- 1- Stop running of device and unplug it.
- 2- Unscrew the four screws of cleaning cap and remove the cap. (Be careful not to spoil the amyant wicks. If they are spoiled change them.)
- 3- Remove the directors inside the smoke pipes so that the soot can pour into lower chamber.
- 4- Remove the burner from its place.
- 5- Clean all the soot in boiler with a vacuum cleaner.
- 6- Put the burner in its place and run the boiler.

#### CLEANING OF ELECTRODE AND TURBULATOR

1- Stop your device and remove it from the plug socket. Wait for 10 minutes to cool down.

2- Remove the burner from the boiler by loosening the burner screw and pulling the burner toward you.

3- Remove the cover screws to remove the cover which has barrel on it.

4- Clean the electrode porcelains and electrode tips with a dry cloth.

5- Wipe and clean the turbulator. Make sure that the turbulator blades are clean.

6- Make sure that the electrode adjustment is not disrupted. If the setting is corrupted at the time of cleaning, make the adjust as shown in picture 'D'.

7- Insert the cover that has barrel and place the burner in it.





#### **BURNER INJECTOR CLEANING**

In addition to electrode cleanup operations:

1- Loosen the turbulator fixing screw and remove the turbulator and electrodes.

2- Remove burner injector and and the filter on injector and wash with clean diesel.

(Do not insert hard objects into the injector nozzle.) Replace the filter and the injector.

3- Replace the turbulator and check the settings and install the retaining screw.

4- Replace the combustion tube and place the burner in the boiler.

#### CIRCULATOR SPEED ADJUSTMENT

This operation will be carried out by the assembly technician at the first run.

#### C. REQUIREMENTS MUST BE DONE IN FAILURES

#### Fault: The red lamp on the Start button is not shine.

Reason: 1- Electric power is off.

- 2- The fuse might have been thrown out. Check it out.
- 3- The bulb in the button is lit, replace new one.

#### Fault: The lamp on the Start button is shining but the device is not running.

Reason: 1- The adjustment thermostat is set low.

2- Electrical wiring cables have incompatibility, call for service.

#### Fault: The fault lamp of the device is on and not working.

Press the reset button three times for five minutes. If the device does not work again, proceed as follows.

Reason: 1- Diesel's over. Check it out.

- 2- The voltage is low.(At least 200 V) Check it out. If necessary, place a regulator.
- 3- Photocell lamp is dirty. Clean.
- 4- The nozzle is blocked. Clean.

#### Fault: The device is intermittently on and breaks down.

Reason: 1- The burner pump filter is dirty. Clean.

- 2- The tank outlet filter is dirty. Clean up and get the air.
- 3- The diesel is about to finish. Check it out.

#### Fault: High-pitched, metallic and intermittent chirping noise comer from the burner pump.

Reason: 1- The burner pump filter is blocked. Clean up and get the air.

2- Tank filter is blocked. Clean up and get the air.

#### Fault: The boiler is operating normally, but the radiators are not warming up.

Reason: 1- The circulation pump may not work. Check that the pump tightness by rotating the screwdriver head on the pump shaft.

2- Air was collected in the radiators. Take the air from the radiators.

# If your device does not work when the above procedures are performed, we recommend you to contact with an authorized service.

#### **D. WARRANTY CONDITIONS**

In order for the boiler to work well and efficiently for many years:

# \* YOU MUST MAKE PERIODIC MAINTENANCE EVERY YEAR FOR VALIDATION OF 3 YEARS WARRANTY.

In order for your warranty terms to continue for the first three years, you are required to make periodic maintenance every year. You should keep your annual periodic maintenance coupons which are signed, stamped by autorized srevices after care.

#### DO NOT PAY THE FEES WITHOUT SEEINGTHE CURRENT PRICE LIST IN YOUR SERVICE.

#### E. FUEL TYPE

Use diesel as fuel. Be careful that the diesel is free from foreign substances such as water, oil, sediment.

MAKTEK CAN NOT BE HELD RESPONSIBLE FOR ANY DAMAGES CAUSED FROM USING DIESEL WITH ADDITIVES.

### POINTS TO BE CONSIDERED BY INSTALLATOR FIRM TECHNICAL INFORMATION AND INSTALLATION INSTRUCTIONS

#### 1- Technic Information

-Draught need: Chimney draught need must be minimum -2mm ss.

-Combustion chamber pressure: Must be -3mm ss

-Chimney gas outlet temperature: Must be maximum 200°

-Mass of chimney gas: 20m<sup>3</sup>/h (-10)(+10) according to chimney draught

- Chimney outletconnection diameter : 130 mmØ

-Water side resistance:10 m bar

- -Maximum heat power: 20.000Kcal/h
- -Relativistic boiler loss: Maximum 12%

-Boiler gaz volume: 20 liters.

- -Temperature control space: Δt:6°C
- -Combustion room dimensions and volume:23x34=15lt

#### **BURNER DATA**

-Brain: Type G22 220V 18VA -Transformer: Primer 220V 55VA, secondary 2x10 KVA 30m A -Engine: 220V 75W 0.6A 2800 D/D -Injector: 20MK için:0.50 G/h 60°- 80° -Circulation pump: 20MK 15/5 (10-19-32 W)

#### **2- DATA ABOUT CHIMNEY**

Before installing the MAKTEK central heating boiler you need to check whether the boiler is suitable and sufficient.

a) Chimneys should be made plastered in the sections mentioned in the project of the radiator installation so as not to receive air from the outside.

b) There should be a fresh air inlet at the ground level and at least 50% of the chimney section in order to enter the clean air required for combustion in the boiler room. Also, in order to dispose of the dirty air that can be collected in this area, it is necessary to find open air gap at the ceiling that would have the 25% of the cross section of the smoke pipe.

c) A heating system other than its own heat generator, stove, oven, drying cabinet, water heater and other foreign facilities of a can not be connected to the central heating chimney.

d) A leakproof cleaning cap at a suitable size to chimney section must be provided at the lowest point of the chimneys.

e) Horizontal smoke pipes shall be connected to the chimney with a slope rising at least 5% and shall not exceed 1/4 of the height of the chimney height at any time.

f) There must be a hat on the boiler to protect it from rain or snow.

#### **Chimney Section Calculation**

F= 0,03 x

F= Free section of chimney cm<sup>2</sup> 0,03= coefficient Qk= Boiler Capacity, kcal/h h= Vertical height of the chimney, m.

#### **Example:**

Qk= 20.000 kcal/h (boiler capacity) h= 15m (chimney vertical height) F= What should it be?

1 per 10 million (1990)

 $F = 0.03 \times \frac{QK}{\sqrt{h}} cm^2$ 

 $F = 0.03 \times \frac{20.000}{\sqrt{15}} \text{ cm}^2 = \frac{600}{3.873} = 155 \text{ cm}^2$ 

g) The chimney should be kept away from the outer wall and generally kept at the mid-point of the building, ie at the highest part of the roof and at least 80 cm away from the roof.

h) The chimney section can be calculated using the formula given below.

Make the chimney connection in the frame of this information and check the chimney draught.

3- The safety thermostat is set to 90°C. Make sure that the setting is not changed for any reason.
4- If there is no separate place to install the boiler in the apartment, the boiler should be placed in bathroom, kitchen or balcony. If it is placed in a balcony, it should be kept in a division. The boiler should never be placed in the bedroom.

5- Check the fuel connection line again to prevent leaks.

6- Your system has close expansion tank. Ensure that the installation is filled with water, that the air collected in the radiators are thrown out, and that the air in the boiler is taken out before starting to use.

7- Grounded plug is supplied with the boiler. Ensure that this plug is used with a grounded socket.8- Always mount the plastic reinforced feet in place while installing the boiler and adjust the settings to keep the boiler stable.

9- You must also sign the Warranty Document by submitting the date of delivery and supply the fuel and make authorized the service to start running of boiler. Deliver it to the user in working condition.

### **INJECTOR SELECTION TABLE**

INJECTOR					PUMP PRESSURE, bar (kg/cm <sup>3</sup> )				
GPH		7	8	9	10	11	12	13	14
0,4	Capacity	1,24	1,32	1,4	1,47	1,54	1,61	1,68	1,75
	Power	14,71	15,65	16,6	17,43	18,26	19,09	19,92	20,75
0,5	Capacity	1,45	1,57	1,65	1,73	1,81	1,89	1,97	2,05
	Power	16,62	18,62	19,57	20,51	21,5	22,42	23,36	34,31
0,6	Capacity	1,81	1,93	2,01	2,23	2,32	2,42	2,52	2,64
	Power	21,46	22,89	23,83	26,44	27,51	28,7	29,88	31,31
0,65	Capacity	2,00	2,12	2,25	3,08	2,63	2,74	2,7	2,8
	Power	23,72	25,14	26,68	36,53	31,19	32,49	32,07	33,21
0,75	Capacity	2,35	2,5	2,65	2,8	2,95	3,07	3,2	3,33
	Power	27,87	29,65	31,43	33,21	34,99	36,41	37,95	39,49
0,85	Capacity	2,75	2,92	3,1	3,27	3,45	3,6	3,75	3,9
	Power	32,62	34,63	36,76	38,78	40,92	42,69	44,47	46,25
1,00	Capacity	3,1	3,3	3,5	3,67	3,85	4,02	4,2	4,38
	Power	36,76	39,13	41,51	43,52	45,65	47,67	48,72	51,95
1,25	Capacity	3,85	4,12	4,4	4,61	4,82	5,03	5,25	5,46
	Power	45,65	48,86	52,18	54,67	57,16	59,65	62,26	64,75
1,50	Capacity	4,6	4,95	5,3	5,65	5,8	6,05	6,3	6,55
	Power	54,55	58,7	62,85	65,82	68,78	71,75	74,72	77,68
1,75	Capacity	5,4	5,69	6,18	6,46	6,75	7,06		
	Power	64,04	67,48	73,29	76,61	80,05	83,73		
2,00	Capacity	6,2	6,63	7,07					
	Power	73,53	78,63	83,85					
2,25	Capacity	6,95							
	Power	82,42							

Capacity (kg/h) Power (kw)

Example: Desired power 29 KW

The nearest value is 28.70 kW to 12 bar pump pressure. This value corresponds to a 0.60 GPH injection. When you look at the vertical column, appropriate pump pressure will be seen as a 12 bar.

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