

Istanbul, 24.06.2009

Test Approval Certificate

See attachment: Test report no. 24.06.2009 and 09-03-02-3-21-1 belonging to ODTÜ (Middle East Technical University) Faculty of Mechanical Engineering

The branded HIGH POWER Magnetic Fuel Regulation and Saving device produced by Asmer Enerji Ltd. Şti. was tested on 24.06.2009 in the laboratory of the Middle East Technical University, Faculty of Mechanical Engineering, under the supervision of a responsible TÜV Rheinland employee.

The test results are attached and can not be divided from the confirmation letter.

Yours sincerely,


TÜV Rheinland
Uluslararası Standartlar
Sertifikasyon ve Denetim A.Ş.

Hasan S. ARKAN
Managing Director



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**DEPARTMENT OF MECHANICAL ENGINEERING
MIDDLE EAST TECHNICAL UNIVERSITY
ANKARA, TURKEY**

24.06.2009

**TESTING OF A HIGH POWER MADE MAGNETIC REGULATION AND SAVING DEVICE
ON A BOILER**

**Middle East Technical University
Mechanical Engineering Department Test Report
Test No: 09-03-02-3-21-1**

TEST REPORT

HIGH POWER made, totally 22 piece DHP-2 type Magnetic Regulation and Saving Device produced by Asmer Energy Limited Company and utilized in industrial facilities, are installed at the inlet of the boiler fuel line and are tested on a Alarko made boiler with a heating capacity of 700.000 kcal/h, which is Part of the heating system of Middle East Technical University (Picture 1).

DESCRIPTION OF THE EXPEIMENT

To test the HIGH POWER made Magnetic Regulation and Saving Device, Alarko made 812 kW power water boiler is chosen. First, boiler water temperature is brought to the ambient temperature, boiler water exit is short circuited to the boiler water inlet so that during the heating process, water temperature in the boiler becomes more uniform. Then, the burner is turned on and the water which is at ambient temperature is heated to predetermined temperature and then the burner is shut of. During the test, stack temperature of the boiler is measured. At the end of the experiment, water in the boiler is discharged and the boiler is charged with water which is at the ambient temperature. Experiments are repeated till sufficient confidence is gained about the repeatability of the tests. The experimental procedure described above with detail is repeated after the Magnetic Regulation and Saving Device is installed at the inlet of the boiler fuel line under the same conditions.



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**TEST REPORT OF HIGH POWER MADE MAGNETIC REGULATION AND SAVING DEVICE
WHICH IS TESTED ON A BOILER**

1- BOILER PROPERIES

MADE : ALARKO

TYPE : ACK 3 - 700

CAPACITY : 700.000 kcal/h (812 kw)

2- BURNER CHARACTERISTICS

MADE: LOMBARGHINI CALORECLIMA

TYPE : 140 PM/ME 9800 1360

CAPACITY : 561 - 1200 kW

3- NATUREL GAS FLOWMETER CHARACTERISTICS

MADE: IMETER

TYPE : IMRM G 65 DIN, mekanik

CAPACITY : 0,65 - 100 m³/h

4- NATURAL GAS PROPERTIES

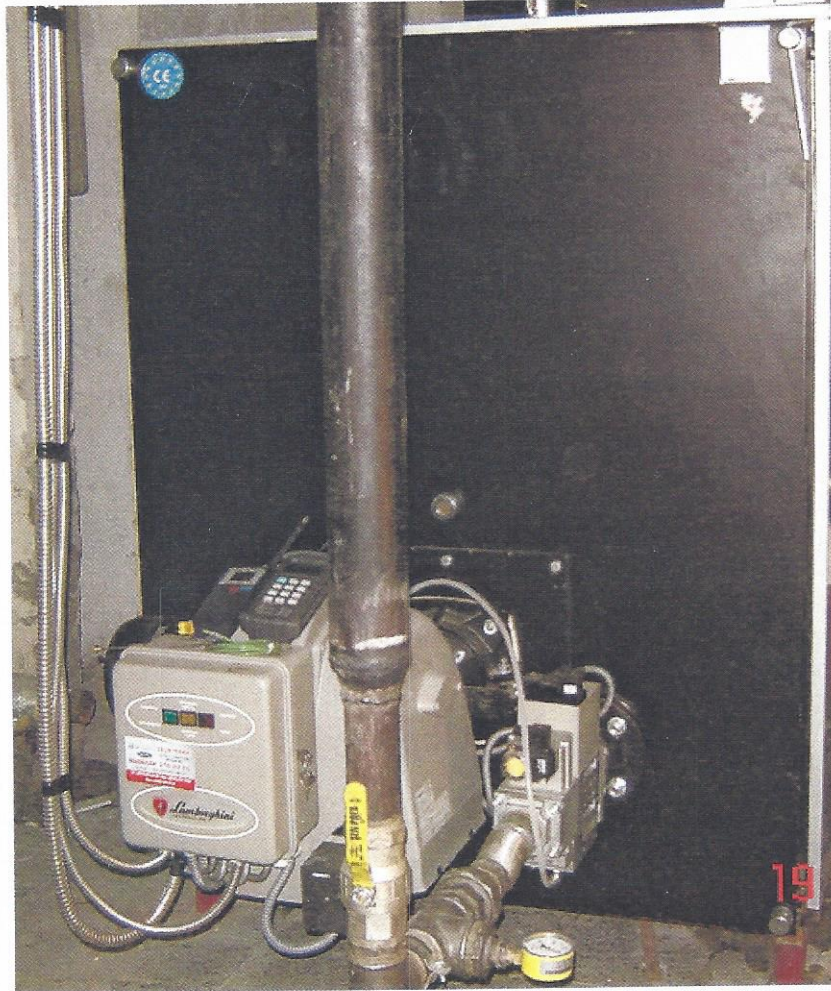
Shown in the tables.



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5-FUEL CONSUMPTION INITIAL READINGS(Saving device is not installed):



Picture 1.

	Reading 1	Reading 2	Reading 3	Average
Ambient Temperature (°C)	23,4	23,8	23,9	
Duration of the test (min, sec)	11,55	11,54	11,58	
Boiler water pressure (mSS)	15,5	15,5	15,5	
Initial Temperature of the boiler water (°C)	23	23	23	
Final Temperature of the boiler water (°C)	76	75	75	
Temperature of Natural Gas (°C)	24,6	25,2	25,2	
Pressure of Natural Gas (mbar)	32	32	32	
Initial reading of the natural gas flow meter (m ³)	2218,942	2235,104	2251,200	
Final reading of the natural gas flow meter (m ³)	2235,104	2251,200	2267,275	
Natural Gas Consumption (m ³)	16,162	16,096	16,075	
Natural Gas Consumed for 1 °C temperature increase(m ³)	0,30494	0,30954	0,30913	0,30787



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6- FUEL CONSUMPTION FINAL READINGS (Saving device is installed):



Picture 2.

	Reading 1	Reading 2	Reading 3	Reading 4	Average
Ambient Temperature (°C)	24	24	24,6	24,5	
Duration of the Test (Min, Sec)	11,53	11,48	11,53	11,47	
Boiler Water Pressure (Mss)	15,5	15,5	15,5	15,5	
Initial Temperature of The Boiler Water (°C)	23	23	23	23	
Final Temperature of the Boiler Water (°C)	78	77	78	78	
Temperature of Natural Gas (°C)	25,4	25,6	25,6	25,4	
Pressure of Natural Gas (Mbar)	32	32	32	32	
Initial Reading of The Natural Gas Flow meter (M3)		2283,223	2298,933	2314,775	
Final Reading of The Natural Gas Flow meter (M3)		2298,933	2314,775	2330,478	
Natural Gas Consumption (M ³)	15,948	15,71	15,842	15,703	
Natural Gas Consumed for 1 °C Temperature Increase(M ³)		0,29093	0,28804	0,28551	0,28816



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Saving ratio according to the averages obtained with and without saving device:

$((0,30787-0,28816)/0,30787)*100=$	6,40 %
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RESULT

To increase the temperature of the 1.6 ton water 1 °C, % 6.40 decrease in the amount of the natural gas consumption is observed after the HIGH POWER Made Magnetic Regulation and Saving Device is installed at the inlet of the fuel line of the hot water boiler.

According to the Stack gas measurements obtained with and without the saving device, stack gas temperature with saving device is measured to be higher than the stack gas temperature without the saving device (without saving device: 160,5 °C, with saving device: 163,8 °C).

These results show that with Magnetic Regulation And Saving Device combustion becomes more complete and by a suitable control of the stack gas temperature an additional saving can be obtained from the stack gases which are at a higher temperature. It is observed that burner firing starting period is %20 reduced after the Magnetic Regulation and Saving Device is installed.

Taking the fact that the boiler and burner tested in this report is new and the boiler has a higher efficiency than similar used boilers into consideration, It is natural to expect that the saving ratio obtained with used or old boilers with average efficiencies might be higher.

Dr. Cemil YAMALI

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