



CERTIFICATE NUMBER  
**CFP 348**  
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## ASSESSMENT CERTIFICATE

### PRODUCT

Burner Management Unit (BM1) and  
Dynamic Burner Management Unit (DBMU)  
(Patent No. EP 0 651 873 B1)

### CERTIFICATE HOLDER

Energy Control Systems Ltd  
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### SUPPLIED AND INSTALLED BY

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### SUMMARY

The Burner Management Unit is designed to modify the burner-firing pattern of conventional Commercial boilers and water heaters (with 40kW input or greater) to minimise wasteful over-firing.

The effectiveness of the Burner Management Unit has been tested on a typical open-flued commercial boiler (rated at 63kW) subject to a fully repeatable load pattern over a course of back-to-back tests with the Burner Management Unit both in and out of circuit.

The assessment, testing and results are described in the following pages, which form integral parts of this certificate.

### LIMITATIONS OF USE

The Burner Management Unit is intended for use with non-modulating conventional gas-fired boilers and water heaters rated at 40kW or higher, and equipped with thermostats that control the firing of the boiler burners. It is less suitable for use with low temperature/low water content boilers, where the potential for saving is less.

The Burner Management Unit must be installed strictly in accordance with the manufacturer's instructions, as inspected by BRE Certification, the requirements of this certificate, and all relevant legislation.

The testing of the Burner Management Unit has demonstrated that the savings achieved on the test rig were highly dependent upon the nature of the load, ranging from zero at constant loads to in excess of 16% at low loads and high economy savings factors. The results of the testing undertaken by BRE demonstrate that gas consumption savings are possible, but their actual value will be highly dependent on the nature of the load and also the size of the system, heat emitters and boiler in relation to the load, the type of system that the boiler is serving and the type of boiler to which the Burner Management Unit BM1 is fitted.

### STATEMENT

It is the opinion of BRE Certification that the savings demonstrated in testing under laboratory conditions are real. Achievement of similar savings on other boilers will be dependent on the nature of the load (and also the size of the system heat emitters and boiler in relation to the load), the type of system the boiler is serving, and the type of boiler to which the unit is fitted.

### CONFIRMATION

For and on behalf of  
BRE Certification

Richard Phillips  
Technical Director (Electronics)

# 1. TECHNICAL SPECIFICATION

## 1.1 Description of Product

1.1.1 The Burner Management Unit - (Patent No. EP 0 651 873 B1) is a solid state, electronic device. It incorporates a microprocessor designed to control the burner regulator on conventional commercial boilers. It is connected to the boiler between the boiler thermostat and the burner valve, and is equipped with a heat sensor that measures the water temperature within the system. The Unit is wired to a single-phase 230/240 volt supply in such a way that it is isolated when the boiler is isolated. The Burner Management Unit (BM1) using software mtukR 3.00 and the Dynamic Management Unit (DBMU) using software mtdynukR1.03 are both approved under this certificate.

1.1.2 The casing containing the controls measures 130mm x 80mm and is 35mm deep. The front cover has a label identifying that it is a Burner Management Unit and including the model identification designation BM1 or DBMU. The label also contains a warning that is not to be interfered with and a telephone number to be used if in doubt.

1.1.3 The Unit is manufactured by Flextronics Int. Nor. AS, in Norway.

1.1.4 The Unit operates by controlling the time intervals between firing of the boiler's burner. It controls the boiler and will work independently of any building management system in operation.

## 1.2 Product Performance

1.2.1 The Burner Management Unit was installed on a typical commercial gas boiler, burning natural gas, fitted with the manufacturer's standard on/off thermostat control. The boiler was installed and commissioned in accordance with the manufacturer's instructions.

1.2.2 A series of tests using a predefined load pattern were undertaken by BRE Ltd to evaluate the performance of the Burner Management Unit. To ensure that the tests were both realistic and reliable, a test rig was constructed to allow a predefined load to be imposed on a real hot water based radiator system. This allowed the dynamics of a real heating system to be fully replicated in a highly controlled environment and for the tests to be fully repeatable.

1.2.3 The gas consumed by the boiler over the load pattern test periods with the Burner Management Unit both in and out of circuit are presented in the following table for a range of Unit economy savings factors:

Ambient air temperature at start of test (°C)	Gas Consumed (ft <sup>3</sup> )			
	Burner Management Unit BM1 off	Burner Management Unit BM1 economy savings factor		
		60%	80%	90%
0	446	419	407	400
5	356	323	309	Not tested
10	251	217	212	211
15	180	Not tested	161	Not tested

The percentage savings achieved were:

Ambient air temperature at start of test (°C)	Percentage gas saving (%)		
	<i>Burner Management Unit BM1 economy savings factors</i>		
	60%	80%	90%
0	6.1	8.7	10.3
5	9.3	13.2	Not tested
10	13.5	15.5	16.1
15	Not tested	10.6	Not tested

1.2.4 The Unit is claimed by Energy Control Systems Ltd to have a minimum life expectancy of 5 years.

## 2. GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1998

2.1 Installation of the Burner Management Unit does not require any modification to gas fittings in the boiler.

## 3. INSTALLATION/PRACTICAL APPLICATION

### 3.1 Storage and Handling

3.1.1 Each Burner Management Unit is identified by a label on the front cover (see 1.1.2) and a unique serial number label applied to the back of the casing. They are pre-packed in a tailor-made cardboard box at the manufacturing plant and delivered to Energy Control Systems Ltd in pre-packed sets of 10.

3.1.2 There are no other specific storage or handling instructions, however they should be stored under cover in dry conditions and handled with reasonable care.

### 3.2 Installation

3.2.1 The Burner Management Unit must be installed by an appropriately qualified, CORGI registered, Dynamic Energy Products Ltd, engineer in accordance with Energy Control Systems Ltd installation and commissioning instructions. It is the responsibility of the Dynamic Energy Products Ltd, engineer to ensure that the Burner Management Unit is suitable for use with the boiler and heating system to which it is to be fitted.

3.2.2 Installation of all wiring must be in conformance with the current IEE Wiring Regulations (16<sup>th</sup> edition at the time of preparation of this certificate).

3.2.3 On completion of installation a commissioning check is carried out by the Dynamic Energy Products Ltd, engineer to determine that the Unit is functioning correctly.

3.2.4 All maintenance and repair work should be carried out by an appropriately qualified, CORGI registered, Dynamic Energy Products Ltd, engineer.

### 3.3 Electrical Safety

3.3.1 The Burner Management Unit is wired into the live supply to the boiler. Therefore failure of the supply to the boiler also results in failure of the supply to the Unit.

3.3.2 The Burner Management Unit is designed to automatically disconnect itself from the boiler circuits in the event of failure of the Unit. This allows the boiler to continue to operate normally.

## 4. TECHNICAL APPRAISAL

### 4.1 Performance Tests

4.1.1 There is no nationally agreed test procedure for undertaking evaluation of the potential savings of boiler burner control units. Therefore the product was tested as described in 1.2.2.

4.1.2 The two load profiles imposed for the tests where:

- A range of steady state heat loads: and
- A 7-hour test where the simulated ambient temperature rose by 10 degrees centigrade from the initial value imposed on the space with a predefined repeatable schedule. The temperatures at the start of the 7-hour test ranged from 0 to 15 degrees centigrade. The room air temperature at the beginning of each test was 19 degrees centigrade.

4.1.3 The 7-hour tests were undertaken with and without the Burner Management Unit operating, using a range of Unit saving factors of 60, 80 and 90%.

### 4.2 Quality Control

4.2.1 In the opinion of BRE Certification the materials and the procedures used for the manufacture and installation are suitable for the application.

4.2.2 The Burner Management Unit is manufactured under a documented quality plan to a defined specification. Each Unit is fully bench tested under simulated operating conditions before being passed for delivery.

4.2.3 In the opinion of BRE Certification the specification of the materials used and the quality control procedures of the manufacturer are suitable for the product.

### 4.3 British Standards

The following British Standard has been referred to for this assessment:

BS7671:2001 Requirements for Electrical Installations, the IEE Wiring Regulations 16<sup>th</sup> Edition.

## 5. CONDITIONS OF CERTIFICATE ISSUE

### 5.1 Validity

This certificate will be valid so far as:

The materials and methods of manufacture are unchanged.

The designs and specifications are unaltered from those used to produce the Burner Management Unit BM1 and the Dynamic Burner Management Unit (DBMU) as tested.

The Factory Production Control of the manufacturing and installation is regularly assessed and compliance with the Quality Plan confirmed by BRE Certification through arrangements made by Energy Control Systems Ltd.

The Burner Management Unit BM1 and the Dynamic Burner Management Unit (DBMU) continues to meet the requirements for audit testing.

## 5.2 Health and Safety

This certificate and the recommendations herein do not purport in any way to restate the requirements of the Health and Safety at Work Act 1974 or any statutory or common law duty of care which exists now or in future; nor is compliance with these recommendations to be assumed as satisfying the requirements of the said Act or any existing or future statutory or common law duty of care.

## 5.3 Reference to other Documentation

Where reference is made in this certificate to any Act of Parliament, Regulation, Code of Practice, British or other Standard or other publications, it shall be construed as reference to such publication in the form in which it is in force at the date of the certificate.

## 5.4 Patents

BRE Certification makes no representational warranty that any patent or similar industrial property right is valid or that the manufacture, use, sale, lease or any other dealing or disposition of the products in whole or in part is not an infringement of any patent or industrial property right not owned by Energy Control Systems Ltd.

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This certificate remains the property of BRE Certification Ltd and is issued subject to terms and conditions. It is maintained and held in force as detailed in clause 5 above.

To check the authenticity of this certificate, please visit our website or contact us.

