



The Certification Mark for Onsite  
Sustainable Energy Technologies

## MCS 014

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Product Certification Scheme Requirements:  
Heat-led micro-cogeneration packages in dwellings

Issue 1.0

This standard has been approved by the Steering Group of the Microgeneration Certification Scheme.

This standard was prepared by the Microgeneration Certification Scheme Working Group 7 'Micro-CHP systems'.

### **REVISION OF MICROGENERATION CERTIFICATION STANDARDS**

Microgeneration Standards will be revised by issue of revised editions or amendments. Details will be posted on the website at [www.microgenerationcertification.org](http://www.microgenerationcertification.org)

Technical or other changes which affect the requirements for the approval or certification of the product or service will result in a new issue. Minor or administrative changes (e.g. corrections of spelling and typographical errors, changes to address and copyright details, the addition of notes for clarification etc.) may be made as amendments.

The issue number will be given in decimal format with the integer part giving the issue number and the fractional part giving the number of amendments (e.g. Issue 3.2 indicates that the document is at Issue 3 with 2 amendments).

Users of this Standard should ensure that they possess the latest issue and all amendments.

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## 1. INTRODUCTION

This scheme document identifies the evaluation, assessment requirements and practices for the purposes of certification and listing of heat-led micro-cogeneration packages. Certification and listing of packages is based on evidence acceptable to the certification body:

- that the package falls within the scope of this scheme document;
- that the producer has staff, processes and systems in place to ensure that the package placed on the market meets the requirements of this scheme document,

And on:

- periodic audits of the producer including testing as appropriate;
- compliance with the contract with the certification body for listing and certification including agreement to rectify faults as appropriate

## 2. SCOPE

This scheme provides ongoing independent, third party assessment and approval of heat-led micro-cogeneration packages intended for installation in single dwellings as the primary heating system, where the package:

- A) has a thermal and electrical output of less than 45 kW<sub>th</sub> or 50 kW<sub>e</sub> respectively.
- B) is fuelled by any of the following – second and third family gas; gas from a bespoke source; hydrogen; mineral oil; other liquid fuels, principally bio-oils; other fuels including unconventional fuels and solid fuels.

## 3. NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this scheme document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

**PAS 67: 2008**, Laboratory tests to determine the heating and electrical performance of heat-led micro-cogeneration packages primarily intended for heating dwellings.

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**G83/1: September 2003**, Recommendations for the connection of small-scale embedded generators (up to 16A per phase) in parallel with Public Low-Voltage Distribution Networks .

**Method** to evaluate the annual energy performance of micro-cogeneration heating systems in dwellings, 9 October 2008 Prepared for Sustainable Energy Policy Division, Defra, by John Hayton and Bruce Young, BRE. Available from: <http://projects.bre.co.uk/SAP2005/supporting-technical-documents.html>

**BS EN 15036-1: 2006** Heating boilers – Test regulations for airborne noise emissions from heat generators – Part1: Airborne noise emissions from heat generators.

**Boiler Efficiency Database**, see [www.sedbuk.com](http://www.sedbuk.com)

**CEN/TR 1749: 2005**, European scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types).

## 4. DEFINITIONS

### 4.1 Categories of Micro-Cogeneration Packages

#### 4.1.1 combiPK

micro-cogeneration package for providing space and water heating in which the Domestic Hot Water (DHW) service is provided wholly from within the package.

#### 4.1.2 heatPK

micro-cogeneration package for providing space heating only (no DHW service).

#### 4.1.3 regPK

micro-cogeneration package for providing space and water heating, intended for connection to a separate DHW storage cylinder of standard specification.

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## 4.2 Cogeneration

Combined generation of electricity and heat by an energy conversion system and the concurrent use of electric and thermal energy from the conversion system.

## 4.3 Cogeneration unit

A unit that is capable of cogeneration.

## 4.4 Dwelling

a unit of residential accommodation including residential park homes, flats, maisonettes, terraced, semi-detached and detached houses (including all such residential accommodation situated within or forming part of commercial or industrial or agricultural premises) and leisure accommodation .

*Note. It is recognised that this definition can be applied to premises such as those supplying a small number of clients on a bed and breakfast basis.*

## 4.5 Heat-Led Micro-Cogeneration Package

Micro-cogeneration package the control of which is by heat demand.

## 4.6 Micro-Cogeneration Package

Micro-cogeneration unit with associated equipment as specified by the manufacturer when submitting for testing against PAS 67.

*Note: Manufacturer is the organisation that submitted the package for testing against PAS 67.*

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## 4.7 Micro-Cogeneration Unit

A cogeneration unit with a thermal and electrical output of less than 45 kW<sub>th</sub> or 50 kW<sub>e</sub> respectively suitable for connection in parallel with the UK public low voltage distribution network in accordance with G83/1.

*Note – This concept is sometimes referred to as “domestic CHP” (combined heat and power).*

## 4.8 Producer

For the purposes of this scheme document, a producer is:

- a manufacturer of a micro-cogeneration package, selling under his own brand in the UK;
- a business based in the UK selling under his own brand (or another brand under licence) a micro-cogeneration package manufactured by another business; or
- a professional importer introducing a micro-cogeneration package to the UK market.

## 4.9 Synchronous mode

Operation of a micro-cogeneration package connected to a public alternating current (AC) electricity distribution network and capable of exporting electrical power to it

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## 5. APPLICATIONS TO JOIN THE SCHEME

Applications should be made to a certification body licensed to operate this scheme. The certification body will provide the appropriate application form and details of the applicable fees.

## 6. MANAGEMENT SYSTEMS CERTIFICATION

Manufacturers shall operate a certified documented manufacturing quality control system, in accordance with the requirements of MCS 010 “Generic Factory Production Control Requirements”.

## 7. CERTIFICATION AND APPROVAL OF THE MICRO-COGENERATION PACKAGE

This section sets out the criteria against which the Certification Body will assess the micro-cogeneration package as suitable for certification and approval together with some supplementary explanatory notes.

### 7.1 Acceptance Criteria

Acceptance of documented evidence will be at the discretion of the Certification Body providing the certification, but at least the following criteria shall be applied:

- a. Evidence of compliance with conditions a) and b) of the Scope of this scheme document;
- b. Evidence of compliance with the relevant requirements of applicable European directives and UK regulations;
- c. Evidence of compliance with the technical requirements for connection and operation as a fixed micro-cogeneration package when installed in parallel

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with the UK public low voltage distribution network (synchronous mode) in accordance with G83/1;

- d. Evidence of compliance with the performance criteria listed in § 9 of this scheme document;
- e. Verification of the establishment and maintenance of the manufacturing company's quality management system in accordance with the Factory Production Control Requirements (FPC) detailed in § 6 of this scheme document; and
- f. Satisfactory review of the technical documentation relating to the package

## 7.2 Supplementary Explanatory Notes

Applications for a range of common packages (package families) will be dealt with on a case by case basis. For example, where one or more characteristics are the same for packages with similar design, construction and functionality then the results of tests for these characteristics on one package may be applied to other similar products.

A certificate is awarded following demonstration of satisfactory compliance with this scheme document, i.e. package performance; FPC; and technical documentation.

Certificates contain the name and address of the manufacturer, model and reference number of the micro-cogeneration package, a unique certificate reference number and the issue number and date.

Certificates are valid from the date of issue and are maintained and held in force subject to satisfactory completion of the requirements for maintenance of certification (see § 10), but remain the property of the issuing certification body.

Details of the manufacturer and the certificated product(s) are listed on the MCS website [www.microgenerationcertification.org](http://www.microgenerationcertification.org).

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## 8. TECHNICAL DOCUMENTATION

Technical documentation for the package must be submitted for review. This documentation shall be presented in English and shall be such that it can be assured that the package submitted for test is equivalent to those that are to be manufactured for normal production. The documentation must consist of the following as a minimum:

- a) Manufacturer's name;
- b) Brand name;
- c) Package name;
- d) Unique package identifier – *shall not be the same as any other package currently listed on the Boiler Efficiency Database;*
- e) Nominal rated heat output;
- f) Nominal maximum electrical output;
- g) Electrical specification – *either 230V 50Hz synchronous single phase or 400V 50Hz synchronous three phase (3 wire or 4 wire);*
- h) Description of prime mover – *e.g. internal combustion engine, external combustion engine, fuel cell, or other (if other an amplified description is required);*
- i) Type of fuel used – *where fuel is unconventional a full description is required;*
- j) Whether condensing or non-condensing;
- k) Type of flue system – *designated in accordance with CEN/TR 1749;*
- l) Category of package – *i.e. combiPK, heatPK, or regPK;*
- m) Details of intended use and application - *this must include details of the minimum and maximum design heat loss of the dwelling for which the micro-cogeneration package is suitable and the recommended plant size ratio – the design heat loss is the instantaneous heat loss in kW from the dwelling when the temperature differential between inside and outside is 20 degrees Kelvin; the plant size ratio is the nominal rated heat output of the micro-cogeneration package divided by the design heat loss;*
- n) A noise test report – *set out in accordance with § 9c of this scheme document;*
- o) Manufacturing drawings and/or specifications including tolerances, issue and revision numbers;
- p) Raw material and components specifications;

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- q) Details of the quality plan applied during manufacture to ensure ongoing compliance;
- r) Where historical test data is requested to be considered for the application, full test report and details of any existing approvals (Note: each application will be dealt with on a case by case basis and further information about the acceptance of previous testing is available on request); and
- s) Installation, use and maintenance instructions.

## 9. PERFORMANCE CRITERIA

For compliance with this scheme, micro-cogeneration packages must be able to demonstrate the listed performance criteria. Evidence of compliance is generally accepted as independent third party testing by a UKAS (or equivalent) accredited test laboratory. However, other evidence of compliance may be considered at the discretion of the certification body (see document MCS 011 'Testing acceptance criteria').

- a) have an attributable, independently verified, energy performance report produced from the comprehensive set of test conditions detailed in PAS 67 appropriate for the intended application of the micro-cogeneration package
- b) *have;*
  - 1. a full set of data produced from the annual energy performance evaluation method for micro-cogeneration packages recorded in the Boiler Efficiency Database

NOTE 1: For information on the “full set of data” required for inclusion in the database producers should contact the Database Operator GASTEC at CRE Ltd, The Orchard Business Centre, Stoke Orchard, Cheltenham, Gloucester, GL52 7RZ (phone 01242 677877).

AND

- 2. a Table in their installation instructions of the HPER value for plant size ratios between 0.5 and 4.0 in steps of 0.1

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NOTE 1: HPER results can be determined using the APM [Annual Energy Performance Method] calculator (an Excel workbook called "PAS67 Declarations and Test Results Tables rev 4e 2-10-2008") available on the website <http://projects.bre.co.uk/sap2005/supporting-technical-documents.html> .

NOTE 2: A micro-cogeneration package qualifies for the micro-cogeneration MCS "Installation Standard MIS 3007" for all plant size ratios where the HPER is  $\leq 0.230$  kgCO<sub>2</sub>/kWh (see MIS 3007 clause **B.3.5**).

NOTE 3: If there is a minimum and maximum plant size ratio for which the HPER complies, then the margin by which the micro cogeneration package outperforms a SEDBUK 86% efficient boiler will be greatest when the plant size ratio is approximately in the centre of the range.

- c) have an attributable, independently verified, noise test report as described in section 6 of BS EN 15036-1: 2006 produced from the test conditions set out in that standard appropriate to the package under test.

## 10. MAINTENANCE OF CERTIFICATION AND LISTING

Certificates and listing are maintained and held in force subject to satisfactory completion of the following requirements for maintenance of certification:

### 10.1 Factory Audits

Certification is maintained through annual FPC quality system audits, which shall include a detailed check that the package being manufactured is to the same specification as the package tested.

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## 10.2 Product Audits

Package audits will be conducted as follows:

- 10.2.1 review of the product technical data files including materials;
- 10.2.2 review of end of line tests in accordance with the manufacturer's quality plan; and
- 10.2.3 in exceptional circumstances, justified by the certification body, repeat testing of elements from § 9 a) of this scheme document to confirm that the package continues to meet the minimum performance requirements for certification and listing.

## 11. CERTIFICATION MARK AND LABELLING

All approved packages listed under this scheme shall be marked with a label to confirm that the package has been tested and certificated in accordance with the requirements of this scheme document. See below for details.

The producer shall use certification mark(s) only in accordance with the certification body's instructions. An example of a certification mark that can be used for this scheme is as follows:



*Certificate No. XXX, approved to MCS 014*

Where "XXX" is the certificate number and the logo of the certification body issuing the certification would sit to the right of the MCS logo.

Producers may only use the mark while the certification is maintained.

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## AMENDMENTS ISSUED SINCE PUBLICATION

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