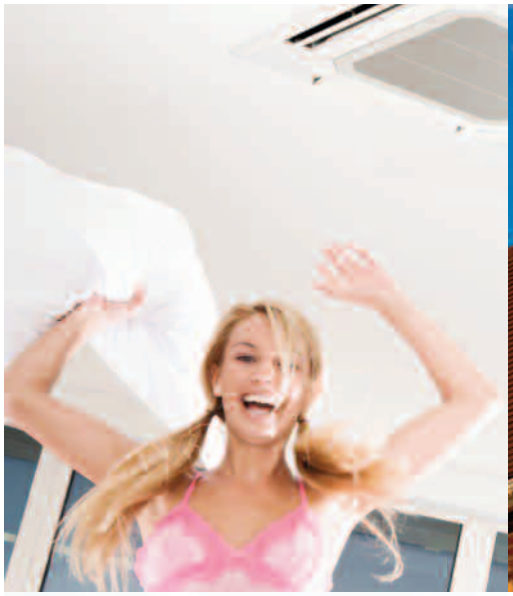



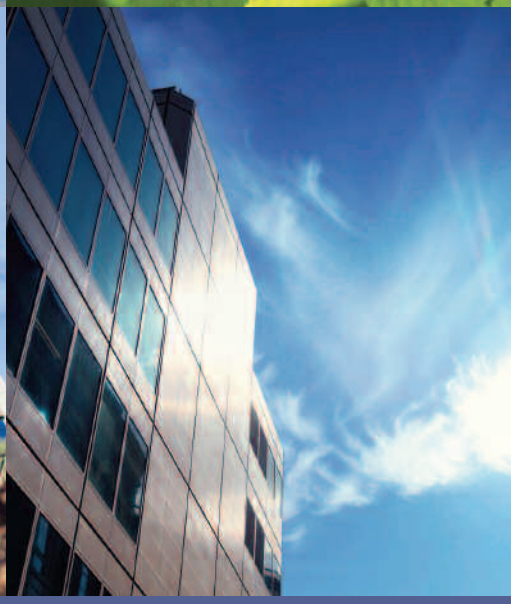

Information Guide:

Energy Performance of Buildings Directive and Air Conditioning Checks

Issue 26

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MITSUBISHI ELECTRIC
LIVING ENVIRONMENTAL SYSTEMS

Information Guide:

Energy Performance of Buildings Directive
and Air Conditioning Checks

This is an independent guide produced by Mitsubishi Electric to enhance the knowledge of its customers and provide a view of the key issues facing our industry today. The guide accompanies a series of seminars, all of which are CPD accredited.

The changing face of construction in the 21st Century demands that designers, specifiers and suppliers work as teams to create better buildings - or occupants and the environment.

Mitsubishi Electric aims to be a part of this by encouraging employees and customers to work together to increase their knowledge of the latest technology, legislation and markets.

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Energy Performance of Buildings Directive
simple and efficient

The EU Energy Performance of Buildings Directive (EPBD) will be familiar by now to anyone working in the construction sector. Introduced in 2003, this Directive brought in a number of important developments for the design and operation of buildings across EU member states, including new levels of air tightness, Energy Performance Certificates and inspections of air conditioning systems.

Diagram 1 shows a summary of the main objectives and articles contained in the EPBD. Since 2003, the UK Government has introduced many of these principles and practices into law, largely through Part L of the Building Regulations. The EPBD is now undergoing important changes, in preparation for the launch of a new 'recast' EPBD, possibly as early as 2010. In April 2009, the European Parliament gave strong support by a very large majority of votes in favour of the proposed changes in the recast Directive. Governments of member states are expected to give their views on the proposed changes. Once the Directive is finalised it will be left to EU members states to implement it in their own countries, ahead of a deadline which will be set by the EU.

Diagram 1

Directive on the Energy Performance of Buildings (2002/91/EC)

Article 1
Objectives
1. Calculation
2. New buildings
3. Existing buildings
4. Certification
5. Inspection

Article 2
Definition
EPD = energy actually consumed or estimated to meet the different needs associated with the use of the building

Article 3
Calculation methodology
At national or regional level

Article 4
Minimum EP requirements
For new buildings & rennovation of existing buildings

Article 5
New buildings
Minimum EP requirements & alternative systems

Article 6
Renovation of existing buildings
Minimum EP requirements

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Certification
- Selling / renting
- Benchmarks & recommendations
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Article 8
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Information & communication programmes

Article 13
Adaptation of the framework
= 2 years

Article 14
Committee
Offering assistance

Article 15
Transposition by rules and regulations

Why change the EPBD?

The European Commission has stated that the main reasons for this 'recast' of the EPBD are to: "Clarify and simplify certain provisions, extend the scope of the Directive, strengthen some of its provisions so their impact is more effective and to provide for the leading role of the public sector."

Another reason for the recast of the EPBD is that the European Union has set itself new and tougher targets on reducing energy use across all its member states. This is part of a Climate and Energy Package which will also see new targets for reducing greenhouse gases and increasing use of renewable energy sources in Europe. The buildings sector (commercial and domestic) continues to be regarded as a major source of potential energy savings.

A report by the EU Commission states that if the buildings sector realised its 'untapped' energy savings potential then the EU could consume 11% less final energy by 2020. This would bring other benefits such as reduced energy needs, reduced import dependency and reduced energy bills for consumers and businesses.

The EU Commission accepts that the existing EPBD has not been entirely successful in action. This, states the Commission, is partly due to the complexity of the sector and what it terms market failures. However, blame is also placed with "some limitations of the wording and scope of some of the provisions of the current EPBD and the low level of ambition of its implementation by some member states." The recast Directive will therefore address these shortcomings, and by implication be more ambitious in its targets for energy efficiency in buildings.

Main changes to the EPBD

The main objectives and principles of the EPBD (as shown in Diagram 1) will be retained, and as with the current EPBD, member states will be expected to implement the new Directive into their own legal systems by a deadline (yet to be put in place). The EU Commission is stressing that the proposed new Directive should not be an excuse by member states to slow implementation of the current EPBD.

There are six main areas targeted for changes:

1. The wording of some provisions of the EPBD will be clarified.

2. The scope of the provision on carrying out energy performance improvements when a major renovation is carried out will be extended. This means that the threshold of 1000m^2 will be removed, only 28% of the building stock is above this figure, so the new EPBD will affect far more of the existing building stock.

3. The provisions on Energy Performance Certificates (EPCs), inspections of heating and air conditioning systems, and use of independent experts will be 'reinforced'. The proposal is that inspection documentation should be subject to random testing under an independent quality control body.

4. There will be a new 'benchmarking calculation instrument' for determining the cost effectiveness of achieving certain levels of energy performance. The aim is to prevent cost being a reason not to improve a building's energy efficiency.

5. Member states will be required to encourage greater market uptake of low or zero-carbon and energy buildings. Measures could include financial and fiscal incentives to businesses, homeowners and tenants such as reduced rates of VAT for renovation services. As well as an EPC, the proposed recast EPBD also says that owners and tenants of commercial buildings should also 'be obliged to exchange information regarding actual energy consumption'.

6. The public sector will be required to take a more active role and 'lead by example' on energy efficiency in buildings. By 31 December 2010 public buildings (used by a public authority or regularly visited by the public) of more than 250m^2 must have an EPC. And all public authority buildings over 250m^2 will have to have a Display Energy Certificate by that date. Public authorities should also be encouraged to carry out energy efficiency improvements recommended in their EPC's.

With 160 million buildings in the European Union, the construction industry will continue to find itself at the forefront of the battle to reduce the EU's energy consumption. Designers, installers, operators and building occupants will all have to play their part in achieving the new targets set by a recast EPBD.

Regular checks for air conditioning systems

One of the most significant elements of the EPBD was its introduction of regular inspections for heating and air conditioning systems. The first deadline for these inspections has already passed: air conditioning systems over 250kW rated output should have undergone their first inspection in January 2009. This includes buildings with multiple separate systems which add to up to 250kW rated output as long as they are controlled by the same person. The next deadline is for systems where effective rated output is more than 12kW. They need to have a first inspection by January 4th 2011.

The proposed recast EPBD also includes these inspections, as an important step in ensuring the energy efficient operation of a building. It also recommends that inspections of heating and air conditioning systems are carried out at the same time and that they should be a part of the energy performance certification process. The aim is to reduce the administrative burden for building owners and occupiers. Although these checks are a legal obligation, they do offer a number of advantages for clients. Not least of these is the fact that an air conditioning system which is well maintained will operate more energy efficiently and be less likely to break down.

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What is an air conditioning inspection?

The inspection covers the refrigeration and air movement equipment that is part of the air conditioning system, as well as controls. Documentation on maintenance programmes will be checked. The assessor must also estimate whether the system is correctly sized for the required cooling loads, and provide advice on ways in which the system might be improved. The exact methodology for an inspection is described in the CIBSE Technical Manual TM44.

The main areas of the equipment inspection are:

Refrigeration

Inspection will check for indications of damage or lack of maintenance that reduce efficiency. Checks for effective heat rejection, including access to an adequate flow of air and the state of outdoor heat rejection equipment and indoor heat exchange equipment.

Air movement systems

Where these are installed as part of the system, checks will be carried out to assess any damage to fans, or blockages on filters or heat exchangers. Grilles, screens or pre-filters will be checked to assess if they are blocked by debris or damaged.

Controls

These are assessed in some detail, since controls offer good potential for reducing energy use in a very cost effective way. For example, incorrect control settings or poorly positioned sensors can increase energy use considerably. The assessor will look at set temperatures; time periods; appropriateness of control zones; methods of refrigeration capacity control and air flow rate control.

The aim of the inspection is to provide building owners and managers with information on the efficiency of the air conditioning systems in their buildings, as well as advice on how the performance of these systems could be improved. An inspection does not include cleaning or repair services, unless this is agreed by the assessor and client before the work is carried out. Clients are advised to ensure the assessor is qualified to carry out such work.

Who is responsible for the inspection?

The person who 'controls' the air conditioning system is responsible for ensuring inspections take place. This refers to the person who controls the technical functioning of the system, and this will depend on how the building is managed or leased. For example, where a tenant takes total responsibility for a building and its services then the tenant controls the system.

If the operation and maintenance of a system is undertaken by an outsourced facilities management consultancy, it should be made clear in any contracts which party has responsibility for these system checks.

Inspection reports should be kept safe, since they will impact on subsequent inspections. They will also have to be handed over to new tenants or building owners. CIBSE recommends that these records should be kept with a building log book. If you take over control of an air conditioning system which should have been inspected, but do not receive a copy of the inspection report, it is your responsibility to have an inspection carried out within three months.

An air conditioning inspection must be carried out by an accredited air conditioning assessor. There are a number of Government approved schemes, and any assessor must have successfully attended one of these. Schemes are run by CIBSE, RICS, BESCA and others. A full list can be found at **www.communities.gov.uk/epbd**.

Don't forget the F Gas Regulation

The EU has set targets for reduction of greenhouse gases, among these are fluorinated gases (F gases). The F Gas Regulation requires regular leakage checks, repairs and gas recovery from systems to help cut leakage into the atmosphere. Only properly certified personnel can carry out this work, and there are strict rules on labelling of equipment and reporting. Checks must be carried out regularly, between every three months or annually depending on how much refrigerant is in the system.

Part L - an overview

The EPBD is not the only environmental legislation undergoing changes. The UK Government released its proposed changes to Parts L and F of the Building Regulations in June 2009, for a consultation period lasting until September 2009. The current aim is to bring in the new Part L in October 2010.

These areas of the Building regulations deal with energy in buildings and ventilation. Part L was last updated in 2006, but will be re-introduced as Part L 2010 next year. The main reason for this is that the UK Government has set higher targets for energy use and carbon emissions in the domestic and commercial buildings sector.

In its July 2007 Policy Statement, Building a Greener Future, the Government stated its aim of ensuring all new homes will be net zero carbon by 2016. In the 2008 Budget, the Government announced an ambition that all new non-domestic buildings will be net zero carbon from 2019. Since proposals on energy efficient buildings affect air tightness, Part F will also be updated to ensure adequate ventilation is provided.



The proposed changes to Part L include a number of points which aim to overcome problems with the current legislation, and which make compliance more likely. For example, the Government is currently carrying out a review of the building control system which will help ensure greater compliance. Other technical elements of building design are also being addressed in the current proposals.

Most significantly, the consultation includes a 'Future Thinking Paper' (FTP) which asks for views on how Parts L and F might evolve beyond 2010. The Government aims to tighten energy performance standards for homes, but more detail is required. There is also a plan to update the Code for Sustainable Homes to ensure that it does not conflict with developments in Parts L and F.

The points below are a summary of the main proposed changes to Part L, but a reading of the full proposals is recommended. These can be found online (see our More Information section for links to relevant websites).

- A 25% aggregate reduction in CO_2 emissions will be required for all buildings compared with 2006 levels. This means that some buildings will have to meet less than 25% reduction; others more, depending on building type.
- Compliance software will be used to list the key features that enable a building to meet its energy performance target.
- All design stage submissions to Building Control will need to be accompanied by a specification. Designers will also have to submit a commissioning plan at the outset of a project.
- There is a revised limit on solar gains for non-domestic buildings.
- A fuel-based target emission rate (TER) will be introduced to help to improve energy efficiency.
- Emissions from electric heating systems will be capped at the same rate as for oil heating.
- The accuracy of SAP calculations will be improved by moving from an annual to a monthly calculation system and by including updated weather data.

Once the consultation period on the changes to Parts L and F is complete, the Government has to respond to this input within three months.

The Further Information section of this Guide indicates the best websites to find out the latest news on these developments.

Further information

You can find more information on the topic of **Energy Performance of Buildings Directive and Air Conditioning Checks** and related issues at the following websites:

For in-depth background to the recast EPBD, see the European law website, EurLex **http://eur-lex.europa.eu** and for the section on the EPBD go to **http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52008PC0780:EN:NOT**

For information on air conditioning inspections, see the CIBSE website, where you can also purchase the TM44 manual on inspections from the CIBSE bookshop. **www.cibse.org**

For information on the Consultation on changes to Parts L and F of the Building Regulations, see the Communities and Local Government website. Consultation closes on 17th September 2009. **http://www.communities.gov.uk/publications/planningandbuilding/partlf2010consultation**

If you missed the CPD seminar on **Energy Performance of Buildings Directive and Air Conditioning Checks** you can call your Mitsubishi Electric Regional sales office to arrange an in-house presentationof this information.

Please call one of the numbers below:

London North East & East Anglia	**01707 282480**
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www.greengatewayinitiative.co.uk