

April 2010

Inspection of Air Conditioning Systems Overview

Introduction

In England and Wales, Part 5 of the Energy Performance of Buildings (Certificates and Inspections)(England and Wales) Regulations 2007 (EPB) implement Article 9 of the Energy Performance of Buildings Directive (EPBD). They require regular inspection of all air conditioning systems with rated outputs over 12 kW at intervals not greater than 5 years.

Timescale

The regulations are being adopted in two phases. The first phase applies to systems with a rated cooling capacity above 250 kW and the second phase for the remaining systems over 12 kW. The cooling capacity of an air conditioning 'system' is further defined as "the sum of all individual cooling units under the control of one building owner or operator". It may therefore include smaller 'window-box' and split units, which are considered to be part of the 'system'.

- First inspection of all existing systems over 250 kW cooling capacity must be completed by 4 January 2009.
- First inspection of all existing systems over 12 kW must be completed by 4 January 2011.
- New systems over 12 kW installed after January 2008 must be inspected within 5 years of being put into service.

Air Conditioning System Definition

The EPB Regulations define an 'air-conditioning system' as:

A combination of all the components required to provide a form of air treatment in which the temperature is controlled or can be lowered, and includes systems which combine such air treatment with the control of ventilation, humidity and air cleanliness. The air conditioning system represents any of the systems described as above, and includes any associated water and air distribution, exhaust, heat recovery and humidification systems that form part of the system. It also includes the controls that regulate these systems. It excludes mechanical ventilation systems that provide no mechanical cooling and any components that are only intended to provide heating that might be contained in the systems.

Aims and Objectives

The primary aim of the inspection is to give building owners and operators information about the performance of their buildings and plant, and to identify opportunities to save energy and cut operating costs.

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The inspection will, as far as possible, be carried out by making visual observations of the plant and other visual indicators such as refrigerant sight glasses, pressure, temperature or filter gauges, although where these are not available the inspector may be able to take some test readings.

Buildings constructed subsequent to Building Regulations Approved Document L2 (2002) should have a number of information sources that will benefit and improve the process of inspection. These should include the installation of energy sub-meters to the main air conditioning system components and the provision of a building log book containing simplified descriptions of the air conditioning system, the locations and specifications of its components, and details of its method of control. In these cases the building owner or manager should have completed records of energy consumed by the major plant, at least on a monthly basis.

However, a majority of buildings will not yet have this information, so the assessment of likely energy efficiency is broad-based and uses indicators from a variety of the most accessible sources. The inspection is primarily based on visual observations and non-invasive measurements where there are opportunities for these to be readily undertaken.

Health and Safety Issues

Inspectors have a duty to comply with relevant health and safety legislation. This includes a duty to draw the building owner or manager's attention to obvious instances of inadequate maintenance or neglect, where these might have implications for the health and safety of building occupants or the public. The inspector's report, while stressing the aim of the inspection in addressing energy issues, should draw to the attention of the owner or manager to any such issues about which the inspector is concerned or is unsure.

Assessment of Efficiency

Obtaining a good estimate of air conditioning efficiency can be a very complex process involving a considerable investment in time, equipment and expertise. The assessment is intended to provide a broad view of the design and operation of the system without putting a numerical value on the performance. It addresses areas in which efficiency could be compromised from the design intent, or where aspects of the system could be improved. It also includes guidance on preparing the views required by the EPB Regulations on the size of the system compared with the cooling load and on alternative solutions. The assessment is based on observations and inspections concerning a number of key factors.

Provision of Advice

The EPB Regulations require the provision of advice, but do not impose any requirement on the system owner or manager to act on that advice. The benefit of the inspection to the manager would be the provision of appropriate advice on possible improvement or replacement of the air conditioning systems and on alternative solutions that would increase efficiency and reduce energy consumption.

For advice to have any real potential to be adopted on a voluntary basis, it will indicate improvement options that are cost-effective over a relatively short period, or are otherwise evidently needed for the system to work effectively. Advice based on this assessment is not expected to involve detailed consideration of the individual system component costs or their use in the particular building, or detailed cost benefit analysis.

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Extent of the Inspection

Time required to undertake the inspection

The time taken for the inspection will depend on the extent of the systems installed. Where the only system is a simple 12 kW split 'packaged' unit, the process should take only a few hours. Although the checks suggested here are intended to be fairly minimal, it is doubtful whether a larger system that includes indoor and outdoor cooling plant, AHUs and zone controls could be completed in much less than a day, and substantial installations could take considerably longer. Some of the tasks (e.g. examining inside AHUs or ducts) would probably need to be undertaken outside normal working hours, and must be carried out in collaboration with the building owner or manager, and be subject to a proper risk assessment. Report preparation should take no more than a day for one complex system.

For an estimate of an air conditioning inspection, please contact us with details of your system.

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References: CIBSE TM44 Document



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