

# Building Automation and Control Systems



[HTTP://WWW.BUILDUP.EU/NEWS/37577](http://www.buildup.eu/news/37577)

**Building Automation and Control Systems (BACS)** control and supervise mechanical systems in buildings. Mechanical systems may include heating, cooling, air-conditioning, ventilation, lighting, blinds & shutters, security, fire alarms, and more. The purpose is to provide a comfortable and safe indoor environment in an energy efficient way.

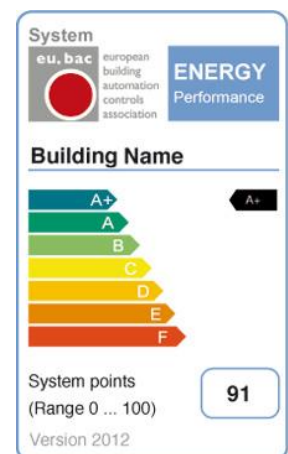
The BACS is normally fully automatic and executes control sequences, control strategies, alarm and supervisory tasks, and data logging. Building managers and occupants use the system. This is usually either to change the automatic operation (e.g. changing the temperature setpoint in an office room), or to investigate the status of spaces or equipment connected to the system (e.g. checking the inlet and outlet temperatures of a heating plant).

## What can BACS do for energy performance in buildings?

As a result of the [Energy Performance of Buildings Directive \(EPBD\)](#), about 40 technical standards were developed to harmonize the energy calculation methods concerning buildings. [EN 15232](#) is the standard that concerns the energy impact of building automation, controls and building management.

EN 15232 contains a model based method called 'factor method' that allows **easy and approximate assessment of the performance improvements** for three (heating, cooling and miscellaneous) energy forms being brought to the building.

The basic principle of EN 15232 is to **use building controls to ensure that energy is used only if a demand exists**. The functions are being mapped to classes D to A. The resulting factor indicates the approximate amount of savings per function/class. These factors are of course dependent on building type (e.g. office, hospital).



## Certification procedure for Building Automation and Control Systems

[eu.bac](#), the [European Building Automation and Controls Association](#), has developed a **plan for promoting improved energy efficiency of Building Automation and Control Systems (BACS)** with the help of existing [European Standards \(EN\)](#) and a new certification scheme.

The procedure for [eu.bac Certification Scheme \(eu.bac System\)](#) is designed as a three step process:

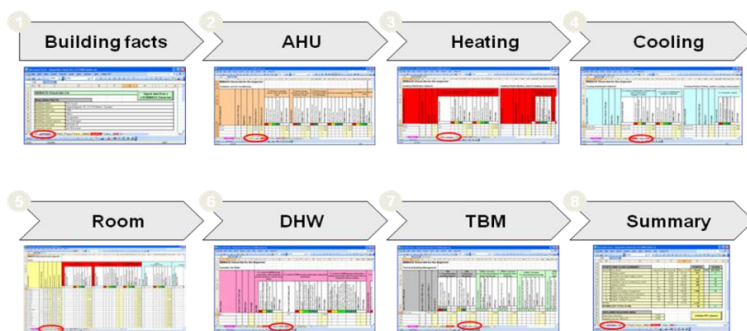
- 🏠 **Self-declaration**  
The provider of BACS self-declares that the particular system is capable of delivering the functionality described in the [Technical Recommendations](#).
- 🏠 **Certification of a BACS installation in a specific building**  
This is done by an authorised inspector who makes a site visit.
- 🏠 **Periodic inspection of the BACS installation**  
This is to verify that the certified functionality is still working properly.

Non-residential building types	Overall BACS efficiency factors $f_{BACS,th}$			
	D	C (Reference)	B	A
	Non energy efficient	Standard	Advanced	High energy performance
Offices	1,51	1	0,80	0,70
Lecture hall	1,24	1	0,75	0,5 <sup>a</sup>
Education buildings (schools)	1,20	1	0,88	0,80

OVERALL BACS EFFICIENCY FACTORS  $f_{BACS,th}$  - NON-RESIDENTIAL BUILDINGS

The periodic inspection helps **counteract the tendency of systems to deteriorate over time**. This is an inherent issue due to the analog and mechanical nature of the installed systems.

## BACS inspection and classification



According to the methodology of EN 15232, a [checklist](#) guides an auditor to inspect all performance relevant controls components and weighting with regard to space, usage profile and effective implemented functionality. Building type and other site relevant data is also required.

BACS rating classification is a normalised point value between 0 and 100. **An**

**improvement of 10 points will result in up to 5 % improvement of energy use.** The [audit result overview](#) of the eu.bac System (status of October 2013) shows such a potential for improvement.

**The finally achievable reduction in the real environment may be different**, for instance because of a different user profile, but this calculated value allows at least a rough estimation of the impact of the intended improvements.

## Relationship with other classification systems

**The method corresponds with other classification systems**, e.g. [LEED](#), [HQE](#), [BREEAM](#), etc. This simplifies the process if the building is also submitted to any of these classification systems.

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