eu.bac Position Paper
Directive Energy Performance of Buildings

General

The European Building Automation and Controls Association (eu.bac) as representative of the Home and Building Automation Industry appreciates all activities of the European Parliament and of the Council to promote the improvement of the Energy Performance of Buildings (EPBD) within the European Community.

The EPB Directive 2002/91/EC defines requirements for the technical building systems/services, such as boilers and air conditioning systems. Moreover the Directive imposes a general framework for the calculation of energy efficiency of buildings.

To significantly and permanently reduce energy consumption and carbon dioxide emissions, it is necessary to use building automation and controls (BAC) technology.

BAC technology is a pre-condition for energy efficiency and safety in buildings, particularly for apartment blocks, offices, education buildings, hospitals, hotels etc..

Building Automation and Controls Systems (BAC Systems)

State of the art: Non-residential buildings are equipped with BAC Systems or devices. BAC Systems monitor, optimise, interlock and control heating systems, air conditioning systems, cooling systems, lighting systems, blinds, fire and security systems, elevators etc..

Large complex de-located properties require functional links to the different technical building systems. These links are necessary to optimise the control and monitoring of all systems, and to allow the measuring medium data, energy management and maintenance management.

BAC Systems and devices comply with the requirements of the standards defined by CEN/TC 247 and ISO/TC 205.

BAC Systems consist of:

- operator stations and other human system interface devices
- devices for management functions
- control devices, automation stations and application specific controllers
- field devices and their interfaces

The main functions of BAC Systems are:

- monitoring of HVAC and lighting systems, such as setting limits, run time totalisation, event counting
- interlocks, such as plant control, safety and frost protection control
- closed loop control, such as P, PI/PID control loop, set point/output limitation
- calculation and optimisation, such as h/x directed control, event switching, time schedule, optimum start/stop, night cooling, room temperature limitation, energy recovery, peak load limitation, energy tariff switching as well as management functions (historical data base) and operator functions (graphic, plant schematic, dynamic display).

In fact BAC Systems integrate the most important information of all technical equipment in the building and act as an central point or “Brain” in the buildings.

This will give the customer the confidence that comfort, safety and performance will be taken into consideration at the highest possible level for reasonable cost.

Requirements of BAC Systems

BAC Systems are an essential part of the technical infrastructure in buildings.
It is necessary to stipulate requirements because of their important functionality and the promotion of the energy efficiency of buildings.

Boilers, heating systems, air conditioning systems, cooling systems, lighting systems, blinds, fire and security systems, elevators etc. in buildings should be equipped, by default, with BAC devices to monitor, interlock, control and optimise different processes in buildings.

eu.bac suggests specifications for BAC Systems and devices to be used for the following applications:

1. Each room of residential and non-residential buildings with heating systems should be equipped with devices, which control the room temperature depending on time and usage.

2. Domestic hot water systems should be equipped with automated devices, which control the temperature of storage water heater depending on time and usage, preventing legionnaire’s disease.

3. Air conditioning systems in buildings with rooms of similar type and use should be equipped with automated devices, which control the room temperature depending on time and usage. In addition to this requirement offices, hospitals and indoor swimming pools should be equipped with automated humidity controls if needed.
   Restaurants, theatres, and conference facilities etc. should be equipped with automated indoor air quality controls.

4. Cooling systems in non-residential buildings should be equipped with automated devices, which control the room conditions depending on time and usage.

5. Lighting systems in non-residential buildings should be equipped with automated devices, which control the illumination depending on time and usage and/or presence of persons.

6. BAC Systems and devices with an important impact on the energy efficiency of buildings should be maintained at regular intervals at least once a year or earlier if required.

7. To support the implementation of the EPB Directive eu.bac suggests to define:

    a) Respective process parts for the different types of buildings according to Annex of EPB Directive

    b) Different applications (See Appendix: Heating, Air conditioning, Domestic hot water, Cooling and Lighting)

    c) Specific requirements on BAC Systems devices.

8. eu.bac suggests in accordance with CEN/TC 247 to calculate energy efficiency of BAC systems and devices for four parts of processes (emission, distribution, storage, generation - see appendix) to make sure that all different impacts are considered .

    a) Process part: Emission
    Depending on the quality of BAC Systems, the same emission system may achieve different efficiencies.

    b) Process part: Distribution
    Depending on the energy load of the emission system, the quality of BAC Systems/devices results in different demands for heating and electrical energy. The average load (temperature & flow) of the distribution is relevant.

    c) Process part: Storage
    Depending on energy load of the distribution system and the quality of BAC Systems/devices, different heating needs arise. The average load (temperature & flow) of the distribution is relevant.

    d) Process part: Generation
    Depending on energy load of the distribution system or the storage and the quality of BAC Systems/devices, different needs for heating and electrical energy are required. The average load (temperature & flow) of the distribution and generation is relevant.

In the past, the different process parts - emission, distribution, storage, generation - in the different technical building systems/services (heating, domestic hot water, air conditioning, cooling, lighting) were separately controlled. Nowadays, BAC Systems/devices link the most important functions of different technical building systems/services. BAC Systems/devices optimise, operate and control all the building processes (Energy Management). This is producing marked improvements of the energy efficiency in buildings.

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