Case note
Eco-friendly technologies for use in construction
Home automation spurs increasing energy efficiency in buildings

The importance of a better electricity consumption

The search for greater efficiency is a major commitment in every sector, the aim is pursuing better energy consumption and environmental protection. Electricity generation, distribution and consumption are no exception: it plays a key role because the whole chain, from production to consumption, results in losses of up to 80% and by employing the latest technology solutions, could be reduced by at least 30%. As far as increase in end-use efficiency of electricity is concerned, the technological management of residential and commercial buildings is highly noteworthy, as the use of electrical energy represents more than 50% of the energy utilized for heating, air-conditioning, lighting and other needs.

The estimated figures for saving energy

The key tool to arriving at a more efficient management of buildings involves home and building automation systems. According to expert studies, increased efficiency can result in energy savings that can vary from 30 to 60% (source WBCS). Given the multiplicity of the parameters to consider (design characteristics and use of the property, geographic area, exposure to specific climate factors), the results of the studies do not always coincide (to reach a unanimous result, a case-by-case analysis on each building would need to be carried out).

Notwithstanding, all the studies cite, for example, savings of up to 50-60% using automated lighting, up to 15-20% using automated heating, increased savings (up to 40%) using automated ventilation, and so on. These figures are more or less consistent with practical use. Therefore, it can be correctly inferred that by using an efficient control system, automation and monitoring of all installations, energy savings of at least 30-40% can be reasonably expected if a proper analysis of the use of the building is implemented. This fact has also been confirmed in studies carried out on some of the applications made recently with systems supplied by ABB.

Interventions on Regione Molise building

The new building in Molise is the result of the re-use of a property that had ceased its function for years and then was subjected to a set of targeted interventions. They had as a main purpose the adaptation of the building and of its parts to the current legislation, as well as the functional reorganization of the surfaces, aiming at an appropriate cost-benefit ratio, a balanced efficiency standard between management levels and maintenance costs.

The building, which consists of five external floors and a basement having a whole surface of 6600 square metres, is provided with a building automation system based on the international KNX standard that combines the administration of different electrical and special installations, such as the energy distribution, the ordinary and emergency lighting and security.

Some of the main functions performed by the system mainly concerning energy efficiency are as follows:

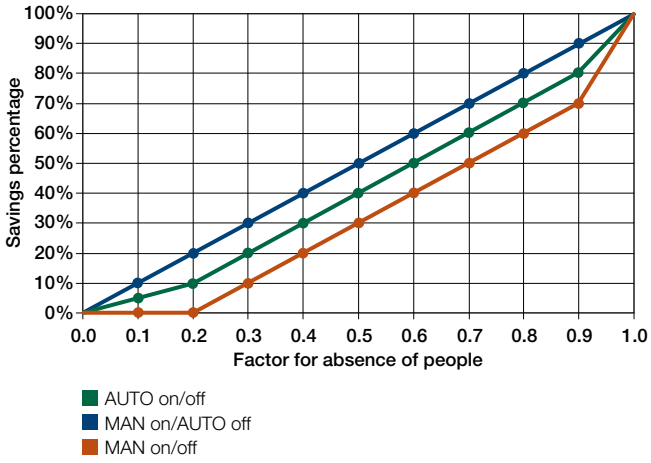
- Switching control and division of lighting according to the presence of people in different settings and the level of natural lighting;
- Control of the air-conditioning according to the presence of people in different settings and to the windows opening and solar radiation.
- Possibility of control, instruction and supervision through a Pc and a Touch Panel installed in the porter's lodge of all the appliances and installations managed by the system: internal and external lighting, presence survey system in the offices, air-conditioning unit, windows and sunshades, protection switches. Through the Pc it is also possible to set the switching time of loads which need to function in specific time slots (external lighting, corridors lighting etc.).

Key figures and results

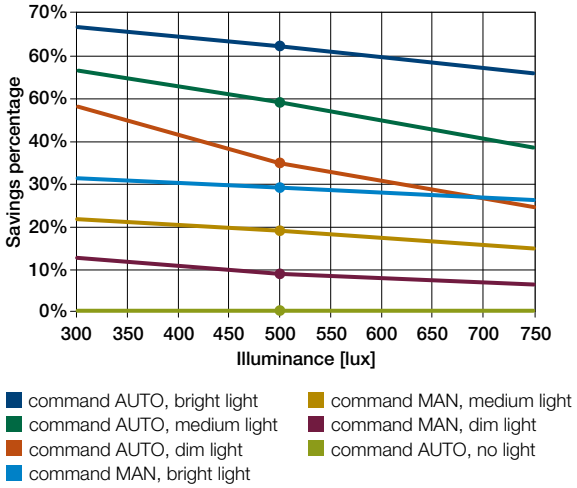
Automation systems installed in the building allow to realize the functions required by the EN 15232 Regulation for class A energy efficiency which compared to class D allows a saving of about 50% for thermal energy, 20% for electric energy of auxiliary switches and 40% for electric energy of lighting system. According to the estimate for the lighting system alone, the annual electric energy saving is about 50-60 MWh, corresponding to a saving of about 10,000 Euros.

The total amount of energy saving achieved by the use of intelligent control systems, according to the methodology presented by the regulation, was estimated to be 38%.

Electric energy saving by using "Presence control"



Electric energy saving by using "Flux control"



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