



Smart Hospital: How intelligent building technology makes hospitals safer, more efficient and better equipped for the future

Frankfurt am Main, 2 September 2026. Hospitals are among the most demanding and, at the same time, most energy-intensive buildings to operate: they must meet the highest standards of hygiene and safety around the clock while remaining cost-effective. To this end, an increasing number of healthcare facilities are turning to intelligently connected building services technology, which links ventilation, air conditioning, lighting and energy management via digital systems. ISH, which will take place from 15 to 19 March 2027 in Frankfurt am Main, will demonstrate just how far this development has progressed.

Ventilation technology: the cornerstone of patient safety

Few areas of building services technology in a hospital are as critical to safety as ventilation and indoor air management. In operating theatres, a low-turbulence displacement flow ensures that air contaminated with germs is specifically extracted from the core area of the theatre, rather than being dispersed throughout the room. High-efficiency particulate air (HEPA) filters, defined positive pressure conditions relative to adjacent rooms, and the continuous monitoring of particle counts, temperature and humidity ensure that the strict requirements of relevant standards, such as DIN 1946-4, are consistently met. Isolation rooms for patients with communicable infectious diseases, on the other hand, operate under negative pressure to protect other areas of the hospital.

Building services are becoming increasingly integrated with clinical processes. If the operating theatre management system reports an upcoming operation, the building automation system can automatically bring the theatre up to operational level, pre-condition it and activate the medical gas supply – even before staff and patients arrive. This shortens lead times, reduces energy consumption during idle periods and, at the same time, increases process reliability. This is made possible by the integration of hospital information systems, operating theatre scheduling, building automation and facility management via open standards. Greater emphasis is also being placed on patients' well-being: indoor climate, air quality, acoustics and lighting control can now be individually tailored to treatment rooms and patient rooms, whilst building automation ensures that medically necessary thresholds are maintained in the background.

Energy efficiency meets hygiene standards

Hospitals consume around 300 to 700 kilowatt-hours per square metre per year – many times the amount of energy used by comparable office buildings. The largest single item, accounting for 30 to 45 per cent, is the ventilation and air-conditioning systems. This is precisely where modern efficiency solutions come into play, without compromising hygiene requirements: heat recovery systems utilise the waste heat from exhaust air, electronically commutated motors operate at high efficiency even under partial load, and demand-controlled ventilation adjusts the air flow rate to the actual occupancy. In

operating theatre areas, the air flow rate may be reduced during non-operational periods whilst maintaining the minimum requirements – a measure that has already proved its worth in practice: By implementing demand-based night-time shutdowns of the operating theatre ventilation, Dresden University Hospital achieved significant savings per operating theatre, whilst the St. Franziskus Foundation in Münster was able to significantly reduce its electricity consumption across five buildings by replacing older fans with EC drives. Overarching energy management systems also coordinate energy-intensive processes, thereby helping to combine hygiene safety, sustainability and cost-effectiveness.

Digital infrastructure as the foundation

For the systems to work together reliably, a robust digital infrastructure is required. Building Information Modelling now supports hospital projects from the planning stage right through to ongoing operations: conflicts between pipes and cable routes can be identified even before construction begins, and once the building is complete, a digital twin is created which is continuously updated with real-time data from the building automation system. This model is complemented by wireless IoT sensors, which can be retrofitted cost-effectively even in existing buildings and record data such as occupancy levels or the condition of ventilation motors – forming the basis for predictive maintenance. Because a system failure in a hospital can, in the worst-case scenario, put patients at risk, cyber security is also becoming increasingly important: Building automation networks must be strictly separated from clinical IT systems. Looking ahead, it is becoming apparent that artificial intelligence will increasingly make building control proactive rather than merely reactive – from self-learning ventilation systems to the early detection of operational deviations.

Smart hospital solutions on display at ISH

ISH, the world's leading trade fair for HVAC and water, will take place in Frankfurt am Main from 15 to 19 March 2027 and provides the ideal platform for all these developments. Trade visitors from the healthcare construction sector will find a wide range of indoor air quality solutions – from hygienic ventilation and heat recovery systems to demand-based air volume control – designed specifically for sensitive areas such as operating theatres and isolation rooms.

A second focus is on intelligent building control: exhibitors will present automation solutions that integrate clinical processes, energy management and patient comfort, thereby reflecting precisely the process-oriented approaches that are increasingly in demand in hospital operations. The range of offerings is rounded off by software for the digital networking of building services, facility management and IoT sensor technology, including solutions for digital twins and the cyber security of networked systems. Anyone wishing to gain an overview of the latest trends in the smart hospital will find the right suppliers, technologies and inspiration at ISH to meet the demands of tomorrow.



From ventilation and energy efficiency to digital connectivity: technologies that will also shape the smart hospital of tomorrow are on display at ISH.
Source: Messe Frankfurt Exhibition GmbH / Jochen Günther

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The next ISH, the world's leading trade fair for HVAC and water, will take place from 15 to 19 March 2027 in Frankfurt am Main. www.ish.messefrankfurt.com

Discover the full expert article, "Smart hospital: building technology that protects patients", as well as a wealth of additional insights and industry expertise, 24/7 on [Building. Technology. Solutions](http://Building.Technology.Solutions). – your single destination for the latest trends. Explore fresh ideas and inspiration from the world of intelligent building technology.

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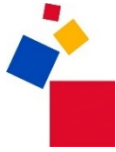
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