

Distributing electrical power safely and economically

Integrated solutions for healthcare



totally integrated power

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Vital and cost-efficient: integrated power supply in hospitals

Today, hospitals are exposed to a rising cost pressure in healthcare; at the same time, innovative medical technology and infrastructure require investments. Therefore, the emphasis also is on efficient operation, and, of course, this must not be to the detriment of high medical quality standards. The balance between optimized costs of operation and full availability of medical apparatus presents new challenges to hospital management.

Totally Integrated Power, the technology platform for seamless, efficient and safe power distribution in buildings, provides this totally reliable and optimized power supply required, having a very positive impact on the hospital's operating costs at the same time – in particular with regard to the many medical devices and apparatus to be power-supplied safely and reliably around the clock.

Absolutely reliable and perfectly matched products and systems permit the integration of all power distribution levels in a hospital, which is the optimal solution. The DESIGO™ building automation system helps to run hospitals efficiently and control room conditions perfectly. It creates a comfortable climate in the building – while observing economic and ecological requirements. This creates the basis for a sustained reduction of operating costs in the energy sector. Take us at our word! With Totally Integrated Power.



Totally Integrated Power™ stands for integrated solutions for power distribution in commercial, institutional and industrial buildings, ranging from medium voltage applications to the wall outlet. This technology platform comprises tools and support for planning and configuring power distribution systems, a well-matched, comprehensive product and systems portfolio and the option to link power distribution to higher-level HMI / control and management systems. This way, noticeable saving potentials can be attained throughout the entire project cycle. With Totally Integrated Power, you can benefit from the full optimization potential of an integrated solution throughout every stage of your building project – from investment and planning to building installation and operation. This is clear added value for everyone involved in the project.

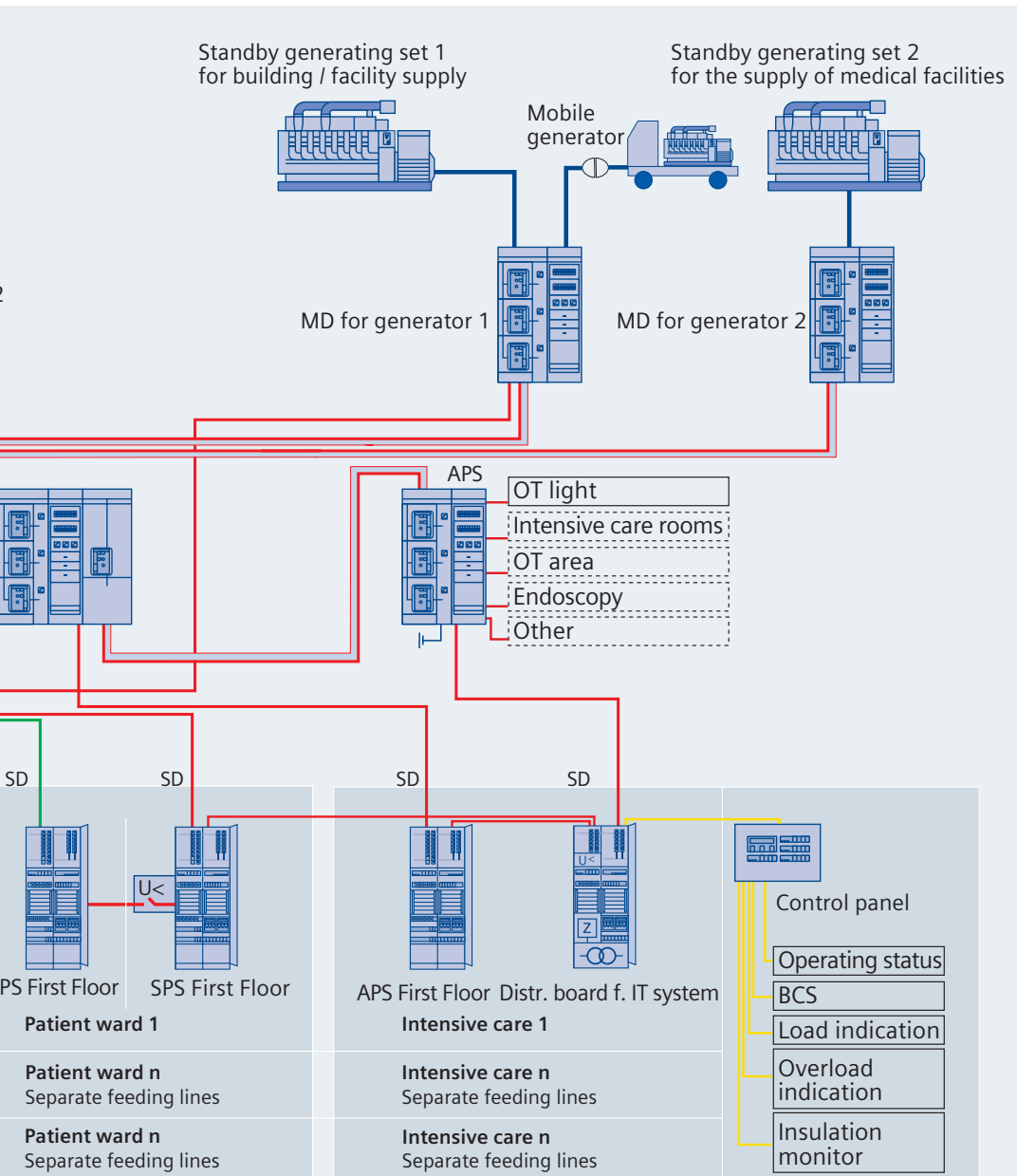
Indispensable: safe power supply in the hospital

In a hospital, the highest priority is on maintaining stable electric power supply at any time. To go on the safe side, electricity supply is secured by using several methods of supply or different power sources: for normal supply, these are usually transformers; standby generating sets are used for emergency power supply, and, if applicable, a combined heat and power plant is used for additional power supply and parallel grid operation.

Flexible: requirements in the individual hospital areas

Depending on the particular medical requirements, consumers are connected to the power sources in defined networks assigned to the different hospital areas. They are allocated to networks by grouping areas in categories 0, 1 and 2 as stipulated in VDE 0100 Part 710. The highest reliability of supply is required by Group 2 areas, such as OT rooms or intensive care wards. The specialist medical staff is responsible for these allocations. They define room use according to medical processes, whereas the task of the electrical planning engineers is to gear electrical power supply to hospital processes. In this planning context, future changes in the use of medical rooms should already be considered. The advantage for subsequent hospital extensions lies in the fact that adjustments of the power supply can be made at relatively low cost. And the result: full flexibility for safe medical care is also ensured in the future.





- NPS = Normal power supply
- SPS = Safety power supply
- |— = Storage battery
- FAC = Fire alarm center
- AOS = Public authorities / organizations entrusted with safety-relevant tasks
- ELA = Electroacoustics systems
- FFE = Firefighters' elevator
- BCS = Building control system
- MD = Main distribution system
- LVMD = Low-voltage main distribution
- SHV = Smoke and heat vents
- UPS = Uninterruptible power supply
- SD = Subdistribution system
- U< = Voltage monitor and changeover switch
- APS = Additional power supply
- z = Insulation monitor

Fire lobbies have not been taken into account.

No matter which hospital area – products and systems from Totally Integrated Power take care of reliable and economical power supply at all levels.



Seamlessly profitable hospital operation: advantages across the entire power distribution system



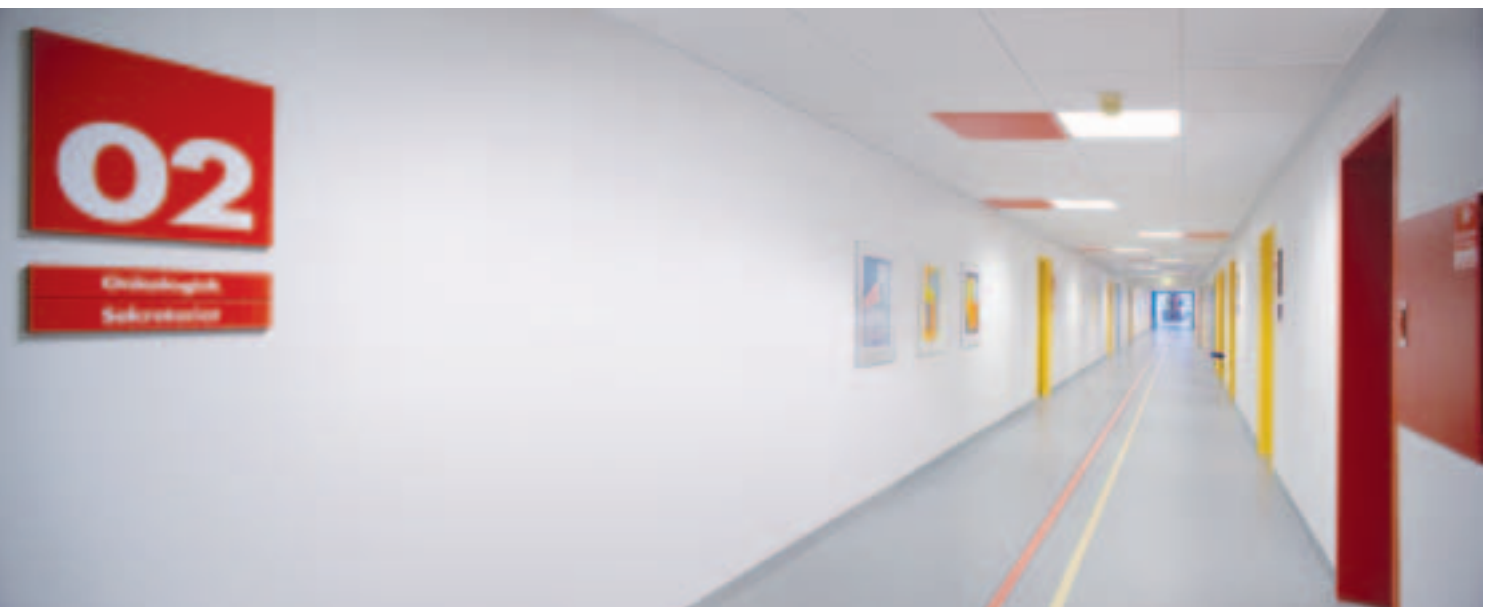
Engineering tasks solved without difficulty

As far as operating costs are concerned, an economical and optimally dimensioned power supply is a crucial factor, especially for hospitals. For electrical engineering consultants, SIMARIS design, the dimensioning software well proven in practice, is an indispensable tool for professionally dimensioning electrical networks. This tool facilitates the calculation of electrical networks, for example, or provides a proof of selectivity and automatically suggests well-matched equipment from our integrated product portfolio. As early as in the planning stage, for example, you can opt for an expansion of the electrical networks by planning power reserves which can then be utilized for changes in the medical use of individual rooms or a future, fundamental expansion of medical care facilities. Current trends show that patient rooms, for example, are converted into operating theaters, and new buildings are erected for outpatient

rehabilitation care. We can offer competent, personal advice and comprehensive support for electrical engineering consultants in almost every planning stage.

Electrical installation made easy

For configuration, installation and plant commissioning, the technology platform of Totally Integrated Power also offers many advantages in terms of time and cost, thanks to its well-matched system components. ALPHA SELECT, for example, supports you in the easy, fast and safe configuration of small-size and normal-size distribution boards; data can be re-used online for product orders. The dimensioning results gained from SIMARIS design, such as cable data and setting values for the switching devices, can be directly used for the installation and commissioning process.





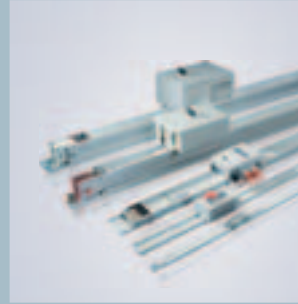
Gas-insulated **medium-voltage switchgear**, like our type-tested, gas-insulated **8DH** or **8DA/8DB** switchgear are the backbone of power supply in the hospital. Being equipped with ultra-modern plant technology, they guarantee maximum operational safety, minimum space requirements and low operating costs across their entire life cycle. Thanks to their gas insulation, the systems require no maintenance for life.



GEAFOL transformers provide the uppermost in terms of human safety in case of fire. They save power and are especially designed for economical long-term use – in particular in areas requiring high safety standards that are frequented by many people. They are flame-retardant, self-extinguishing, and do not emit toxic gases in case of fire.



Type-tested **low-voltage SIVACON switchboards** with fully enclosed functional compartments provide a high safety standard for the protection of human life, limiting the impact of arcing faults and fault propagation to a minimum in case of malfunction. Models featuring flexible withdrawable-unit or plug-in technology are perfectly suited to hospitals, as components can be replaced quickly and easily without interrupting service for longer periods of time.



In order to substantially reduce the fire load on the hospital complex, **SIVACON busbar trunking systems** are a good alternative to cables in many places. Their high short-circuit strength and very low fire load makes them extremely safe. The connection between the busbars and the SIVACON switchgear is, of course, also type-tested, thus forming a safe system. Communication-capable switching and protective devices in their system-specific tap boxes can be linked to building control systems.



Maximum safety, suitable for application in the vicinity of people, can also be attributed to our **ALPHA distribution boards**, which are equipped with low-voltage circuit-protection systems by Siemens. With its equipment range for distribution boards, Siemens provides a comprehensive protection concept with well-matched products for protecting, switching, measuring and monitoring tasks.



Low-voltage circuit protection systems

Our **BETA circuit protection** range provides fuse systems and protective switches that cut off the current in the event of a short circuit and provide protection against hazardous shock currents in case of direct or indirect contact with live parts. **SENTRON switch-disconnectors and circuit-breakers** ensure the safety of people, systems and cabling. **Insulation monitors** are applied in rooms for medical use. They monitor the insulation resistance of the medical IT network, the load current as well as the temperature of the single-phase transformer for IT networks.



Innovative room control functions in the electrical installation provide automation in the patient rooms of the hospital that relies on just one system: **GAMMA instabus**. This helps to save energy costs – single-room control and window monitoring alone, combined with fully automatic shutters and blinds control, help to save up to 30% of the energy costs per year. This system has proven its value, especially for use in large buildings.



No matter which type of room – we can offer matching switches and power outlets specifically suited for use in hospitals. Patient rooms, staff rooms and OT facilities can thus be equipped with matching switches. Colored outlets ensure that the normal power supply network can always be reliably distinguished from the generator-backed networks of the safety supply. Labeling frames with status display additionally facilitate an unambiguous identification of the respective power system configuration.



The focus is on energetic efficiency: our **IEC low-voltage motors** are compact and highly efficient class EFF1 motors. As they are equipped with copper rotors, they are capable of attaining very high efficiency values. Compared with traditional motors, power losses can thus be reduced by up to 40%. These motors are particularly suitable in applications with pumps, fans, elevators and revolving doors.



The **DESIGO™ building automation system** helps to run hospitals efficiently and control room conditions perfectly. It creates a comfortable climate in the building – while observing economic and ecological requirements. DESIGO is not restricted to controlling heating, ventilation and air conditioning, it also boasts a comprehensive, integrated building automation system which incorporates all of the relevant technologies, such as lighting and shutters control, security, access control, power distribution etc. The system incorporates specific modules and customized solutions for hospitals.

More information

More about Totally Integrated Power at
www.siemens.com/tip

More about our healthcare solutions at
www.siemens.com/healthcare

Siemens AG
Automation and Drives
Gleiwitzer Strasse 555
90475 NUREMBERG, GERMANY

www.siemens.com/tip

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