



Healthcare Solutions

*Hygiene, comfort and productivity
for your healing environment*



Improve patient outcomes and



Each year, across Europe, the Middle East, India and Africa substantial investments are made in new and refurbished healthcare facilities. Aging population, health risk factors and population growth are driving healthcare demand in the region.

It is increasingly recognized that hospitals should provide a therapeutic environment in which the overall design of the building contributes to the process of healing, enhances patient safety and eliminates environmental stressors such as noise. Each distinct area of the hospital has precise environmental requirements that can be critical to saving lives while improving staff performance.

The design and quality of the HVAC system is a critical aspect of the facility that impacts on the health of patients, caregivers and visitors. A high quality system optimizes temperature, humidity, ventilation, and pressure relationship with

surrounding areas. It also manages air cleanliness and distribution, operating hours and system reliability for every space in the facility.

Foster thermal comfort and indoor air quality

Each subsection of the hospital is driven by patient and staff comfort, infection control and disease management parameters. Adequate heating, cooling and indoor air quality affects all aspects of a hospital. The design of hospital environments can contribute to poor patient outcomes and staff dissatisfaction.

According to the World Health Organization, in developed countries, between 5% and 10% of patients admitted to acute care hospitals acquire one or more infections. In developing countries, the risk of infection is 2–20 times higher and the proportion of patients infected can exceed 25%. In England, 100 000 cases of Hospital Acquired Infections are estimated to cost the

achieve operational efficiency



Operate at maximum efficiency

The healthcare sector, which has historically been a major user of energy, is understandably coming under increasing pressure to reduce energy use and hence its carbon emissions. As hospital facilities are open 24/7 and have extra commitments on air filtration, circulation, cooling and waste management, they use about 2.5 times the amount of energy as a similar-sized commercial building does.

HVAC systems contribute almost 50% to a typical facility's energy consumption. Sustainable design that integrates system optimization strategies can reduce operating costs and help realize attractive financial and environmental returns.

NHS a minimum of £1 billion per year, with more than 5000 attributable deaths annually. Contamination is mainly caused by personnel, food, medical devices and air. Managing space airflow helps control the spread of infections.

HVAC systems must protect positive pressure of operating rooms, intensive care, nursing and residential rooms. Many other environments must be kept at a negative pressure for the isolation of airborne-infection. There are also special ventilation requirements for autopsy, sterilization, and soiled-laundry rooms, where all air should be exhausted to the outdoors. Proper ventilation and frequent air changes remain the primary objective for a hygienic operating room.

Trane can address healthcare facility needs with the most advanced equipment and controls that meet the precise environmental requirements for individual spaces.

Trane expertise for healing environments

Trane has delivered reliable and cost-effective HVAC systems for healthcare facilities with varying design complexity. At Trane we bring systems-level expertise to help you design, build, install, and maintain integrated HVAC systems. We supply healthcare facilities with the highest quality IAQ to improve patient outcomes, promote well-being and achieve superior performance for today and tomorrow.



High efficiency cooling systems

Trane has the capability to help design high performance integrated HVAC systems, including ground water source systems, water condenser optimization, as well as overall HVAC system optimization, from cooling systems to air system coordination with pre-engineered variable air system applications.

The chiller plant is the heart of a HVAC system. Trane offers a portfolio of chillers to meet your cooling, floor space and sound requirements and give you very high reliability over a wide operating range. Trane chillers not only help create comfort, they also help reduce cost of operation, provide energy efficiency and minimize environmental impact. Trane designs and manufactures all of the essential components of the chiller, including the compressor, exchanger, and controls ensuring that rigorous quality control procedures are applied at every stage, and that these crucial components

work perfectly as a complete system. To complete your chiller system, Trane also proposes different types of heat rejection solutions.

Trane water-cooled and air-cooled chillers are built to last. The simple and robust design of Trane water cooled chillers with few mechanically-moving parts, as well as the absence of highly complex electronic components leads to an average life expectancy of 20 years or more. Our newest air-cooled chiller range combines high efficiency, low-sound levels, extreme reliability and durability. For both new and renovation/retrofit installations, in addition to standard operation, our water-cooled packaged and condenserless helical-rotary chiller can operate with a dry cooler and in heat pump or heat recovery applications. This means reduced energy consumption (of a boiler, for example) or minimized risk of contamination of the condenser loop, and better overall facility efficiency.

- **CenTraVac™, RTWD and RTHD water-cooled chillers** for superior reliability and efficiency
- **RTAC air-cooled chillers** for high performance efficiency
- **AquaStream3G air-cooled chillers** for quiet and efficient operations



CenTraVac™ water-cooled chiller



Air handling systems for superior air quality

By helping you select the right airside components, Trane can help address indoor air quality issues such as temperature and humidity, ventilation, carbon dioxide levels, mold, bacteria, other particulate matter, and noise. At Trane, we recognize the importance of supplying our customers with air handling systems that meet or exceed environmental standards, while focusing on green-build initiatives that contribute to a more sustainable work environment.

Trane CLCF Climate Changer combines the best characteristics of a standardized, packaged air handling system with the flexibility and features required for the healthcare environment. The integrated design promotes easy cleaning and prevents dust and bacterial traps. Interior panels are completely smooth and all seams are protected by an anti-bacterial, silicon-free sealant. Casing is watertight and can be disinfected using liquid products. Eurovent Class 3 dampers EN 1751 ensure exceptional air tightness. As an option, antimicrobial copper coil fins inhibit the growth of bacteria and maintain high levels of energy efficiency.

Trane air side product portfolio includes terminal devices that deliver acoustic comfort, flexibility and energy efficiency to



CLCF Climate Changer™

meet healthcare facility requirements. Trane terminal devices use EC fan motor technology that reduces energy consumption by almost 25% compared to permanent split capacitor technology. The terminal devices come with factory-configured unit controls for ease of installation and integrate the best of control technology to ensure occupant comfort. The one-way water terminals allow air distribution through perfect Coanda effect for a high level of comfort and excellent air filtering. Trane's portfolio of terminals integrates controlled hygiene air volume directly supplied from the terminal into the rooms.

- **CLCF Climate Changer™** for reliable indoor air quality
- **Concealed ductable fan coils** for silent and efficient operations
- **CFAS one-way cassette water terminals** for enhanced occupant comfort



RTHD water-cooled chiller



RTAC air-cooled chiller



AquaStream3G air-cooled chiller



View, monitor, track, trend and report conditions in all critical areas

Precision control systems

Within a hospital we understand that you need to adjust the working environment in certain areas throughout the day, depending on the procedures being performed and the preferences of various staff members. Trane facility control systems that include sensors for occupant spaces have an unparalleled ability to deliver the ideal environment for each healthcare functional area.



Measure and manage building energy consumption

Trane’s proven expertise in chillers has led to the development of advanced Chiller Plant control applications within its Building Management System. The system is also fully capable of handling boiler plants. Trane is the expert in providing advanced HVAC applications knowledge, for example, our variable primary flow system enables savings both on the equipment capital costs and operational costs. The use of other solutions, like ice storage, condensing pressure optimization, free cooling, heat recovery and water source heat pump systems, can bring your facility up to 60% in energy savings. Trane will help you select, design and

document the best systems for your facility needs.

Whether you are looking for a web-based, enterprise-wide, integrated control system for flexibility and reduced operating expenses, or a widely-compatible field controller for building renovation, Trane has the right controls that can optimize system performance throughout the facility lifecycle. Trane controls are engineered to be user-friendly and help achieve the desired temperature, humidity and ventilation for the facility needs.

- Manage multiple facilities as a single enterprise with **Tracer ES™ building automation system**
- Optimize the system operations with **Trane Chiller Plant Control**
- Discover ways to improve efficiency with **Trane Chiller Plant Energy Audit** using Trane Chiller Plant Analyzer
- Take control of your energy consumption with **Trane eView™ energy analysis and predictive management**

Services to sustain system integrity

The reliability and efficiency of your cooling system is directly related to how it is maintained and operated. A lack of proper care can lead to severe malfunctions and costly breakdown. Trane service and support capabilities span every step in your system's lifecycle, from initial start-up, through routine operation, monitoring and maintenance, to system upgrades and improvement. Trane Services offer solutions to ensure your HVAC system's reliable operation and optimal performance.

With the critical nature of healthcare facilities, minimal unplanned downtime is unacceptable. By addressing maintenance needs proactively, you can save significantly and virtually eliminate unscheduled downtime. Trane will help you define the service agreement level best suited to your needs. Whether you are addressing disaster management, equipment risk assessment or need help with contingency planning, Trane can help. Our commitment is to keep your system operating efficiently and effectively, enabling you to focus on delivering quality patient care and improving performance.

- Improve cost of ownership and minimize downtime with **Trane Select™ comprehensive service contracts**
- Enhance system performance with **Trane Care™ Reliability, Energy and Environment proactive service offerings**
- Optimize system operation and efficiency with remote monitoring and analytics of **Trane Intelligent Services**
- Mitigate risk during emergencies and planned shutdowns with **Trane Rental Services**



Automated monitoring backed by Trane experts



Gain peace of mind with Trane emergency cooling solutions



Specialized systems for superior performance

Trane recently helped design a 2.1MW cooling capacity HVAC system for a 42,000 square meter six-floor Government hospital in Brittany, France. The 400-bed new hospital was built consolidating three separate hospital facilities requiring systems-level expertise to deliver the overall solution.

The Solution

- 3 RTHD Eurovent Class A water-cooled chillers with D1 size compressor D3E3 heat exchangers
- 6 dry coolers for heat rejection

- 236 FCD ducted fan coil units and 160 CWS cassettes equipped with ZN controller
- 96 air handling units equipped with controls
- 4 close control units
- Tracer Summit™ Building Automation System

Key stakeholders including the end user, consulting engineer and contractor involved were convinced of Trane's applications know-how. With one integrated system, the hospital is positioned for high performance and has the ability to optimize operations throughout the facility lifecycle.



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For further information please contact:

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.
Trane bvba, Lenneke Marelaan 6, 1932 Sint-Stevens-Woluwe, Belgium, ON 0888.048.262 - RPR Brussels