

TRON

life

magazine no. 24



Climate + Health.

The art of handling clean-air.

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Hospitals: High-performance sectors for air management systems.

In air conditioning and ventilation, hospitals are considered to be the elite sector. From a comfort system for a healthy and energy-saving indoor climate to cleanroom systems with pressure gradient, as well as highly efficient filter systems for cleaning radioactive contamination from the air in radiotherapy: In such a diverse building, all of the air conditioning, smoke extraction and ventilation systems are in use around the clock. In addition, public spaces and sensitive areas must be harmonised in the best possible way so that patients, staff and visitors feel comfortable while getting healthy or staying healthy.

Nevertheless, complex construction projects such as hospitals are the subject of intense public debate since the parties involved often fail to meet the investment sums and construction times negotiated in advance. The problems usually lie in the interfaces between the various trades.

The demand for ideal indoor air quality will continue to rise in the coming years – and so will the already huge number of data points and communication interfaces. TROX wants to pave the way in this area and be a reliable provider of the increasingly demanding technical solutions in the field of ventilation technology, without any complex transitions at interfaces – and our new, standardised system solution TROX O_x makes the problem of interfaces a thing of the past.

We are breaking new ground in the 'electronics' trade, which is new to us, and using our high-quality and recognised components to bring together the diverse demands for safety and comfort in buildings for the first time in a standardised, digital and energy-efficient building automation system.

TROX O_x will make complexity more manageable and enable harmonised, sustainable operation of all products in the long term. For our customers, this brings clear added value. Building owners will also benefit since TROX O_x leads to greater transparency and a significant reduction in costs. For designers, the new TROX CONFIGURATOR is an easy-to-use tool for digital planning of modern buildings.

The result is a coherent system with fewer interfaces, faster planning, implementation and acceptance and lower costs. We have already demonstrated this in impressive style with the construction of the new 'Haus M' at the Klinikum Karlsruhe hospital.

There are more examples at the University Hospital in Tübingen, the Charité hospital in Berlin, the Katharinenhospital in Stuttgart, the Department of Cardiac Surgery at Heidelberg University Hospital and – in the near future – the St. Josef Hospital in Moers, the refurbishment of which is covered in this issue of TROX life. In Moers, we also used our radio-controlled control system, which makes a simple, energy-efficient refurbishment possible.

There is one thing at TROX that never changes: We provide healthy, fresh air for indoor spaces in a way that is both energy-efficient and conserves resources by using heat recovery and sustainable products – and in future, this will be in a perfectly harmonised system with TROX O_x. A future in which profitability and health go hand in hand, true to our mission 'for indoor life quality'.

In this issue, you can also read about:

- How economic pressure should be taken off hospitals.
- Climate change and the effects on health.
- How the built environment affects health and well-being.

I hope you find this issue to be an interesting and entertaining read.



Yours Udo Jung
TROX Board of Management



Climate change and its effects on health.



From heat exhaustion and ragweed asthma to Asian tiger mosquitoes and coronavirus, it is becoming increasingly clear that the effects of the global climate and environmental crisis are not only affecting our weather and our forests, but are directly impacting both our physical and mental health. Allergies are on the rise, new pathogens are spreading and more and more people are developing anxiety in the face of environmental change.

Source: Description on the book cover of 'Überhitzt'



The highly efficient ventilation and air-conditioning technology from TROX already provides 320 million people worldwide with fresh, healthy air and pleasant indoor temperatures.



Heat increases the risk of illness.

Heat waves are becoming more frequent as a result of climate change. But they are by no means the only climate-related danger to our health. The risk of developing skin cancer, respiratory diseases, allergic diseases or infectious diseases is also increasing.

In particular, heat can have an impact on the cardiovascular system and can contribute not only to morbidity, but also to mortality. People of advanced age, people with pre-existing conditions and pregnant women are particularly impacted by the health effects of extreme heat (Winklmayr et al., 2022).

To meet these challenges, the Robert Koch Institute (RKI) is working hard on projects aimed at determining the heat-related excess mortality rate in Germany and at developing appropriate methodologies for estimating these deaths.

The World Health Organisation (WHO) describes climate change as 'the single biggest health threat facing humanity' and recognises the 2015 Paris Agreement as the most important public health agreement of the 21st century. The International Association of National Public Health Institutes (IANPHI) also sees climate change as one of the greatest global challenges in the field of public health. Public health institutes can make an important contribution to climate change-related health issues.



> Rising temperatures



> Extreme weather events



> Air pollution



> Spread of infectious diseases

CLIMATE + SPECIES CRISIS



The climate crisis and the loss of biodiversity are damaging human health.

In more than 200 scientific journals, experts have appealed to the World Health Organisation to declare a global emergency because of the climate and species crisis. This is because there is a risk of devastating consequences for humanity.

Climate change and the loss of biodiversity are inextricably linked and must be tackled together, according to the authors. They believe this is the only way to preserve people's health and prevent a global catastrophe. The WHO must declare a public health emergency of international concern, they say. This is the WHO's highest warning level, and currently only applies to the threat of polio.

The planetary crisis will have major effects on human health as a result of disruption of social and economic systems, as well as shortages of land, shelter, food and water, together with increased poverty, mass migration and conflict, writes a group led by Chris Zielinski from the UK Health Alliance, an association of medical institutions in the United Kingdom.

'Rising temperatures, extreme weather events, air pollution and the spread of infectious diseases are some of the major health threats exacerbated by climate change', says the editorial, which has been published in some of the most cited journals

in the world, such as the BMJ, The Lancet and JAMA. 'Even if we could keep global warming below an increase of 1.5 °C over preindustrial levels, we could still cause catastrophic harm to health by destroying nature.' However, most experts believe that any chance of achieving the 1.5 degree target has now become an illusion, since very few countries are making sufficient efforts to reduce their net greenhouse gas emissions to zero at a fast enough rate.

Due to the change in land use, tens of thousands of animal species are now living closer to humans than in previous decades, it goes on to say. This

would increase the exchange of pathogens even without global warming, which in turn would lead to the emergence of new diseases and pandemics. By contrast, people losing contact with the natural environment and the declining biodiversity have both been linked to increases in non-communicable, autoimmune and inflammatory diseases, and metabolic, allergic and neuropsychiatric disorders. If the agreed climate and species protection targets were not achieved, ecosystems would collapse, say the experts. And: 'If these events were to occur, the impacts on health would be globally catastrophic.'

Sources: RKI, WHO, Süddeutsche Zeitung

An innovative ventilation concept for St. Josef Hospital in Moers.

The ward block at St. Josef Hospital in Moers is a five-storey building. Together with the designers and contractors, TROX has developed a special concept for this project.

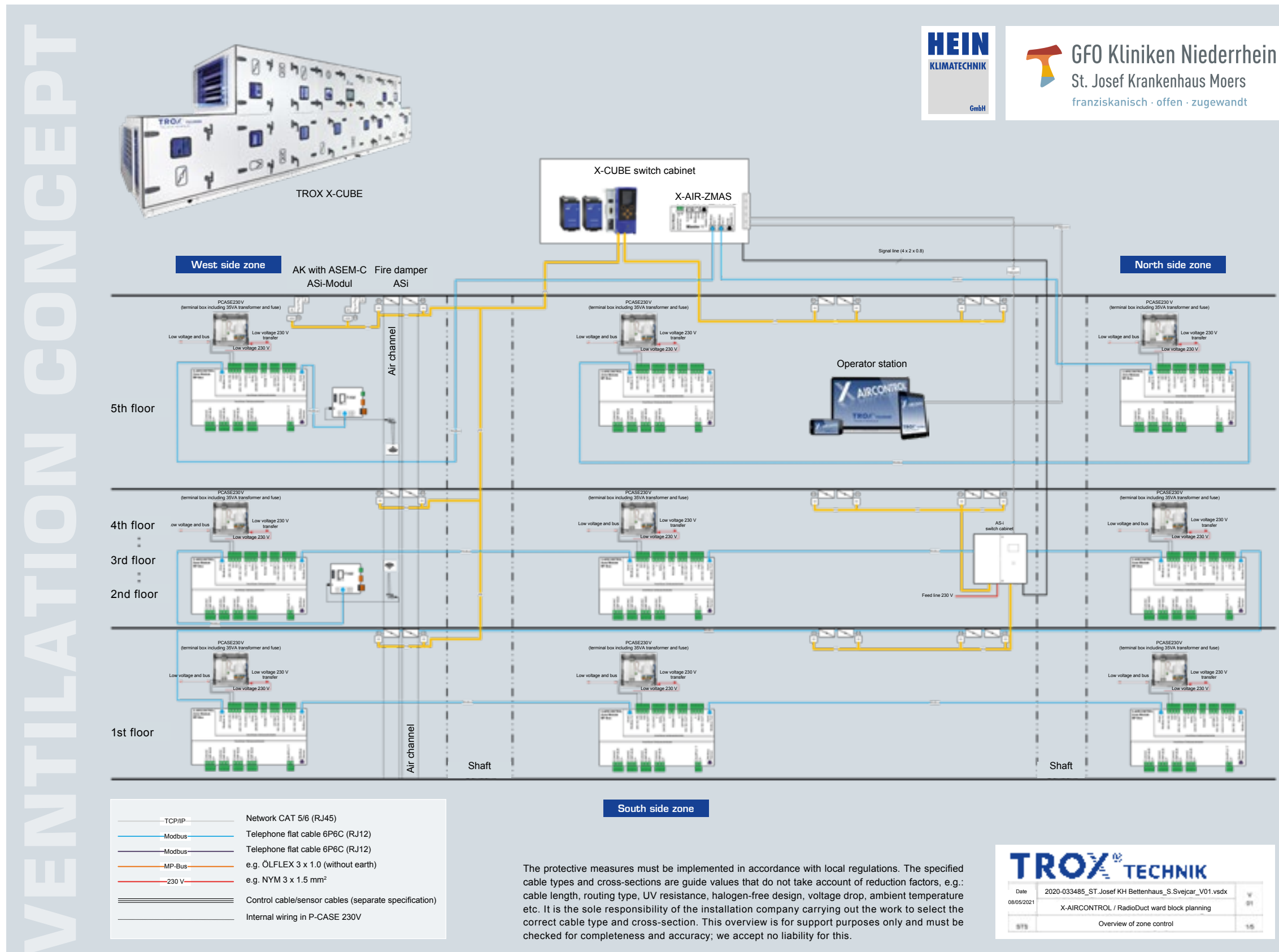
A special concept was required for the gradual core refurbishment of the ward block while hospital operations were ongoing. The floors will be refurbished one by one in an unknown sequence, starting from the fifth floor. For this reason, a combination of conventional wiring and RadioDuct, the radio-controlled control system from TROX, is being used in the building. The concept was developed in close cooperation with Hein Klimatechnik from Duisburg and the architects Schlapeit PBG and implemented accordingly.

The centralised ventilation unit.

The TROX X-CUBE centralised ventilation unit supplies the building from the roof with up to 25,000 m³/h of air. Thanks to the proven and extremely easy-to-install design of the X-CUBE, the requirements of VDI 6022 and DIN 1946-4 for hospital hygiene have been exceeded. The integrated measuring and control technology uses the latest bus technology to transmit information. During commissioning of each floor, the parameters of the system are adjusted accordingly; this was taken into account right from the design stage through the additional functions in the control programmes.

The floors are each divided into three areas: patient rooms, corridors and treatment rooms. The temperature and air quality are controlled to meet demand via the X-AIRCONTROL room control system. Since the cable guides are not fixed until each floor is renovated, RadioDuct is being used to avoid increased wiring and long cable routes.

A combined system is installed to control the central air treatment and the temperature; this system also fully automates the ventilation control. For this purpose, it is necessary to install temperature sensors in the supply air, in the exhaust air and in the various room zones.





A complete overview: The in-house technicians can monitor and operate the system at any time via a web browser.

The ventilation system is operated 24 hours a day, 365 days a year and only provides as much air as is actually needed inside the building and in the room zones.

It supplies the different parts of the building with the ventilation required for hygiene purposes. If necessary, the demand control is adjusted via the in-house technician's remote control level; the downstream room control zones do not have their own time programme. The fresh air that is introduced undergoes flexible temperature control based on the outdoor temperature; in summer or when cooling is

A TROX X-CUBE on the roof supplies the building with up to 25,000 m³/h of air. The requirements of VDI 6022 and DIN 1946-4 for hospital hygiene have been exceeded.



needed, the minimum supply air temperature is 18°C for room zones that are attached to the system, while in winter or when heating is needed, the maximum supply air temperature is 21 °C.

To enable the on-site functions, the existing measurement, control and regulation technology (MCR) of the X-CUBE unit was extended to include project-related additional functions in the programming.

In order to visualise the system for the ward block and a further ventilation system including X-AIRCONTROL for the urology department, the system controllers

Low cabling requirements and straightforward installation mean clear cost savings: RadioDuct from TROX makes it possible.



Demand-based control is economical and energy-efficient while guaranteeing an ideal, comfortable climate for patients and staff.

are integrated into the building's network. Using a web browser, this makes it possible to monitor and operate the systems from a central point.

Intelligent supply air distribution.

Supply air and exhaust air fans generate a specific overpressure in the supply air system and a negative pressure in the exhaust air system in order to supply all downstream room volume flow control loops so that the system is supplied with conditioned air as required.

The volume flow control loops are infinitely variable with 50 to 100% of the rated air flow. When the set zone exhaust air temperature of 22 °C is maintained or if there is an exhaust air CO₂ content of < 700 ppm, the rated air flow of the zones is reduced to 50%. By increasing the zone exhaust air temperature to 24 °C or lowering the CO₂ quality to 1,000 ppm, this is raised to 100%. The zone air flow is continuously reduced with a delay of up to half an hour until the basic air flow is reached in order to ensure that air of a similar quality is achieved in all room air zones.

The air temperature and air quality-dependent zone control ensures that the necessary fresh air is supplied for the people in the building and that the humidity is removed from the bathrooms so that it is not necessary to open windows, as this is disadvantageous from an energy perspective.

The three ventilation control loops per floor have a ventilation function in continuous operation that automatically ensures energy-efficient overall operation of the system. The ventilation control loops are controlled automatically via the ventilation system's central measuring and control technology; manual intervention is only required for checks and, if necessary, adjustments. For this purpose, the system is connected to the on-site network technology and enabled for access by trained personnel who monitor the system via a web browser.

Energy-saving supply air conditioning.

The X-CUBE unit is equipped with energy-saving adiabatic exhaust air humidification. In summer, this system enables the supply air temperature to be reduced by 8 to 10 K without any additional mechanical cooling. The exhaust air is conveyed via the roof and out of the centralised ventilation unit using a directly driven exhaust air twin fan with speed-regulated controller.

Fire technology with a high safety factor.

Fire dampers with thermal release and spring return actuator are installed in the fire compartments of the ceilings on each floor and partition walls, as well as in the corresponding shafts. They are triggered at channel temperatures > 72 °C via a temperature control. If there is a message from the corresponding limit switch, the ventilation system is switched off and all fire dampers with spring return actuator are closed.

Duct smoke detectors are installed in the supply air and vent ducts. If smoke is detected, the systems are switched off and the motor-operated fire dampers are closed so that any transfer of cold smoke or ventilation flow between the floors is prevented.

The TROXNETCOM-AS-i fire damper system has been integrated to enable a flexible response to future fire safety engineering requirements. By positioning the necessary TROXNETCOM-AS-i controllers both in the field and directly in the switch cabinet of the X-CUBE, gradual inclusion of up to 124 AS-i participants is possible.

International projects.

NORWAY



FRANCE



Internationally, ventilation solutions from TROX provide maximum hygienic safety with minimal energy consumption. The creative and comprehensive support offered by TROX during planning and execution is particularly helpful.



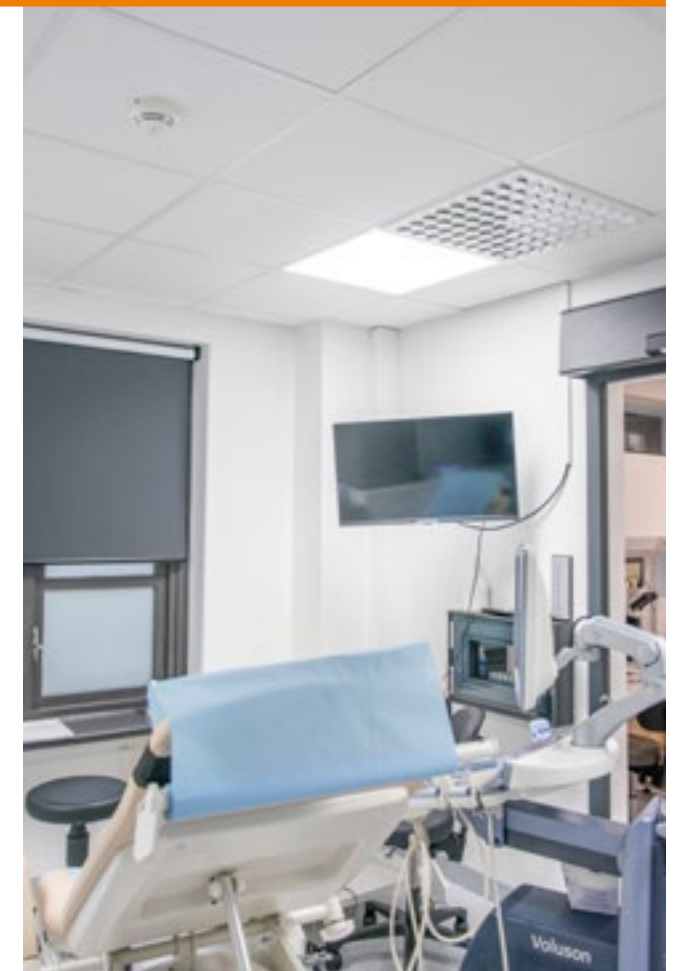
TFC ceiling mounted particulate filter with Opus diffuser face and H14 particulate filter in laboratories, examination rooms and freezer rooms.

TROX Auranor equipped Aleris with complete ventilation technology and supported the customer during the design stage, so that Auranor was also able to supply the TVR regulating devices.

Aleris is also a fertility clinic. Clean air in the laboratory and examination room is essential to ensuring that nothing is contaminated. This is why there needs to be a prevailing overpressure hierarchy, which works perfectly with the TROX system. The fertility clinic is supplied via the ceiling mounted particulate filter with Opus diffuser face and H14 particulate filter.

TROX Auranor supplied the entire ventilation technology:

- TROX universal controller for TVR regulating devices
- TFC ceiling mounted particulate filter with Opus front design
- H14 particulate filters



TROX universal controllers regulate the required room pressures, thereby preventing contamination entering from adjacent rooms.

NORWAY

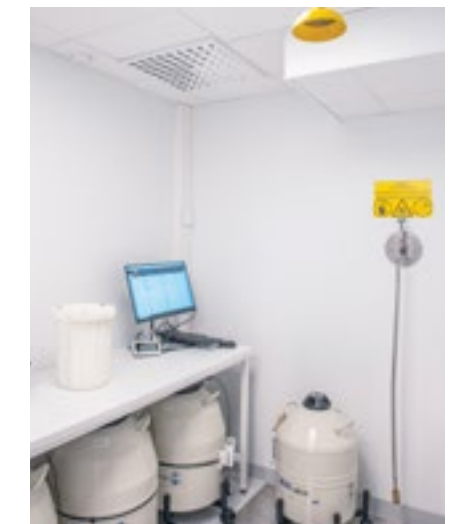
Aleris, Oslo.

Aleris is Norway's leading private healthcare company with a nationwide range of hospital and medical services. Its laboratory is equipped with the latest and most advanced technology. The building was completed in August 2023.



A defined and monitored overpressure hierarchy is mandatory in the laboratory building.

Examination room, laboratory and freezer room with TROX TFC ceiling mounted particulate filter.

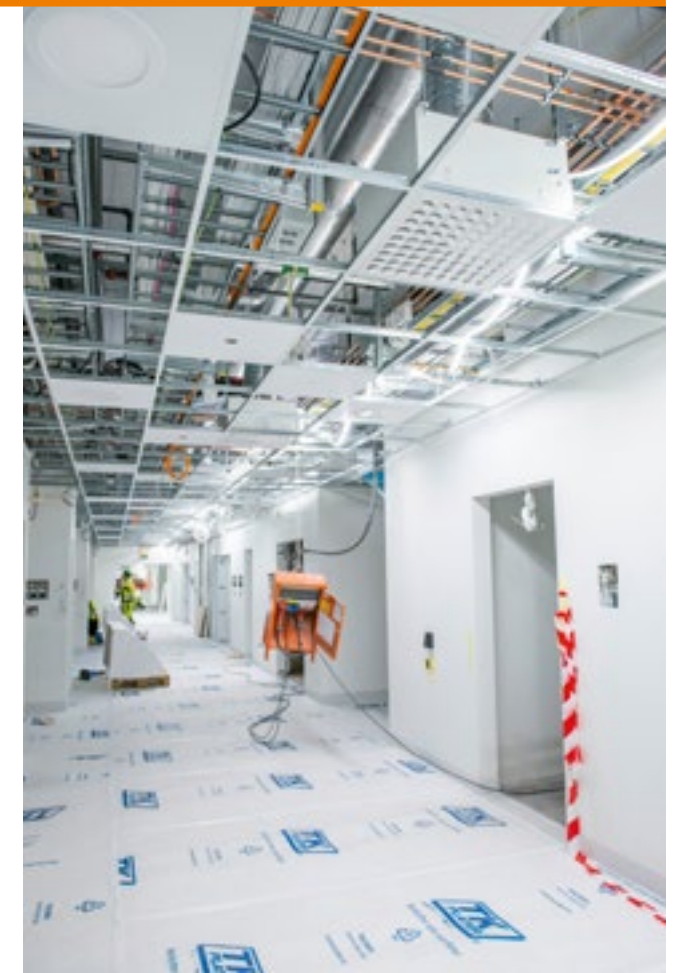




TFC ceiling mounted particulate filter with Opus front design in the operating theatres and corridors.

The proton therapy building will primarily be used to accommodate the highly advanced equipment required for proton therapy – a form of treatment that currently requires patients from Norway to travel abroad. The new clinic and proton therapy building consists of four building sections, which will be connected to the existing building and look like one hospital. In accordance with the agreed framework of the preliminary project, the new building covers an area of 44,259 m²:

- 155 beds
- 10 operating theatres
- 50 day-care spaces
- 61 outpatient rooms
- 20 monitoring rooms
- 3 proton therapy rooms, one of which is for research purposes



The hospital corridor with installed TROX high-tech equipment.

NORWAY

Proton therapy building, Oslo.

The Radium Hospital is developing into a specialised cancer hospital with a new clinic and a proton therapy building. The clinic building will house a number of facilities, including outpatient clinics and wards.

With its advanced equipment, the proton therapy building will make this type of cancer treatment possible in Norway for the first time.



The ceiling's visual design in one of the highly sensitive hospital



TROX Auranor

supplied the entire ventilation technology, including TFC ceiling mounted particulate filter with Opus front design, H14 particulate filter and TVLK air terminal units in plastic for exhaust air systems in highly sensitive areas and TVR, the classic in variable volume flow control.

> The building is scheduled for completion in 2024.



The new building brings together the medical activities of several laboratories in the fields of biology and biopathology.



TROX system technology was chosen to ensure safe, optimal operation of the laboratory.

FRANCE

Construction of a biology and biopathology laboratory at the Centre Hospitalier Régional et Universitaire de Nancy (CHRU).



The 8000 m² building will house the medical laboratories for biology and biopathology operated by the CHRU and the Institut de Cancérologie de Lorraine (ICL) and will include:

- The anatomical pathology laboratory of the municipal hospital
- The Brabois pathological-anatomical laboratory
- The laboratory for pathological anatomy of the ICL
- The ICL tumour biology laboratory

The health centre of the city of Nancy will now have a laboratory building that combines the complex technological and functional sophistication of state-of-the-art biological analysis. Inspired by the iconic diagram of metabolic pathways, the automated technical platform will become a central pathway for sample analysis, surrounded by the secondary pathways of haematology, biochemistry and molecular biology.

Bioinspiration, i.e. the development of innovative materials, devices and structures inspired by solutions found in biological evolution and refinement, also influenced the building design. It has perforated facades of different densities that mimic cell structures, such as those seen through a histologist's microscope. The different hole patterns of the metal panels thus ensure perfect passive protection of the glazed passageways and other sensitive areas of the building.

Laboratory for biology and biopathology

Architect: ArtBuild

Planning: CET Ingénierie

Equipment manufacturer: Santerne (Vinci Group)

Products:

- CTA X-CUBE (12 units)
- ACFI activated carbon filter
- AK shut-off damper
- CAK, CS silencers
- Air terminal units and systems EN, RN, VFL, TVR, VFC, EASYLAB system
- Ceiling diffusers ADLQ, DLQL PU, DLQL DL (laboratory design)
- Ceiling swirl diffusers VDW DL (laboratory design), AIRNAMIC
- ALS slot diffusers



The laboratory building's air conditioning and ventilation system offers hygienic air treatment with reduced energy consumption.



54 TROX H13 HEPA filters are used.

For the TROX engineers, it was important to provide an energy-efficient solution with a high level of comfort that also met the strict hygiene requirements. The planning office CET and equipment manufacturer Santerne commissioned TROX to provide ventilation solutions that combine hygienic air treatment and reduced energy consumption in one outstanding solution thanks to the X-CUBE ventilation units. 12 X-CUBE air handling units supply the building with 153,000 m³/h of treated air.

The laboratory rooms are supplied with conditioned air from hermetically sealed X-CUBE centralised units with hygienically smooth surfaces and fully painted interiors.



The decisive arguments that won the contract:

- Hermetically sealed design of the X-CUBE units
- Corrosion protection class C4
- Smooth, hygienic surfaces and completely painted inside of the housing
- 54 H13 HEPA filters, mounted on welded frame
- Three different heat recovery systems, plate heat exchangers, rotary heat exchangers and combined circulation systems depending on the hygiene requirements in critical/sensitive/public areas of the hospital
- Stone wool insulation with a thickness of 45 mm
- Frame profile 30 x 30 mm
- Metric screw for attaching the HEPA filters to the frame
- Overall control of the 20 laboratories with fume cupboard management thanks to EASYLAB TCU3 technology (42 TVR-ELAB supply and exhaust air controllers). All controllers are equipped with the EM-AUTOZERO expansion module, which ensures that transmitters are always calibrated via automatic zero point correction.
- 21 fume cupboards, equipped with the EASYLAB TVLK-ELAB fume cupboard controller. The fume cupboards are monitored and controlled by the EASYLAB system using position sensors on the sashes.

The BE-SEG-02 control panels can be used to switch off the fume cupboards when they are not in use in order to reduce energy consumption; the minimum volume flow can be reduced to 0 m³/h.

The VDW and AIRNAMIC swirl diffusers, the ACFI activated carbon filters, the RN, EN, TVR and VFC air terminal units, the AK shut off dampers and the CAK and CS silencers were chosen to meet the very strict acoustic requirements as well as the requirements relating to comfort, hygiene and energy efficiency that apply in a hospital environment and, in particular, a medical biology setting.

The DLQL DL and VDW DL air diffusers – with a specific laboratory design – were specially adapted for integration into the sandwich ceiling tiles of the laboratories. The DLQL PU push-up version was chosen in order to integrate filters and make them easier to maintain.

This means TROX has met the strict requirements for hygiene, energy efficiency and safety in full.

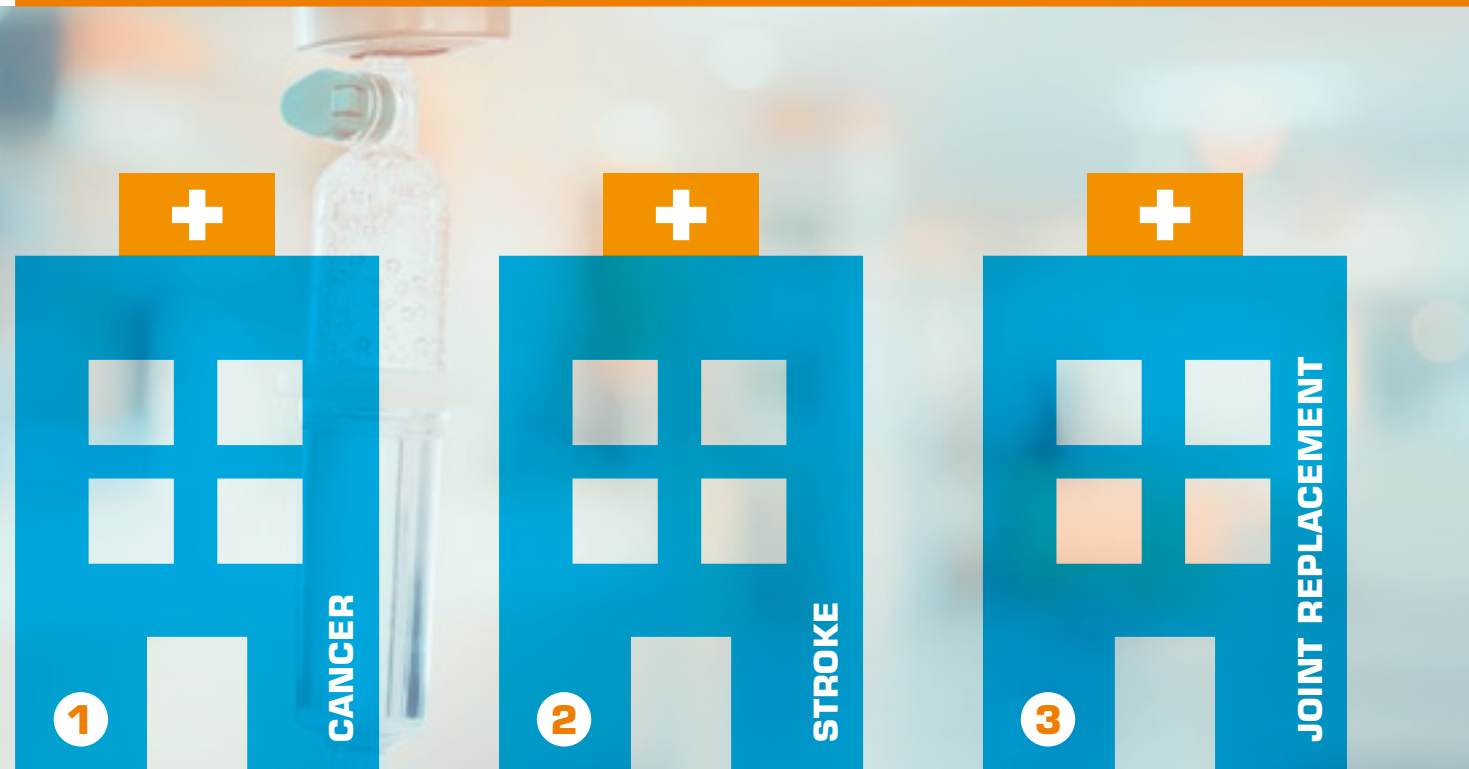
TROX X-CUBE ventilation units generate 153,000 m³/h of treated air.



How the healthcare system can recover.



Hospitals can gain an advantage by specialising. This is the conclusion of a study. Fewer operations, fewer patients would die – these are the arguments in favour of German Minister of Health Karl Lauterbach's reform.



Three treatment groups following reform of the hospital landscape.

German Minister for Health Karl Lauterbach announced a fundamental reform of the hospital landscape some time ago. Rather than every hospital continuing to do everything, a division into three treatment groups is planned.

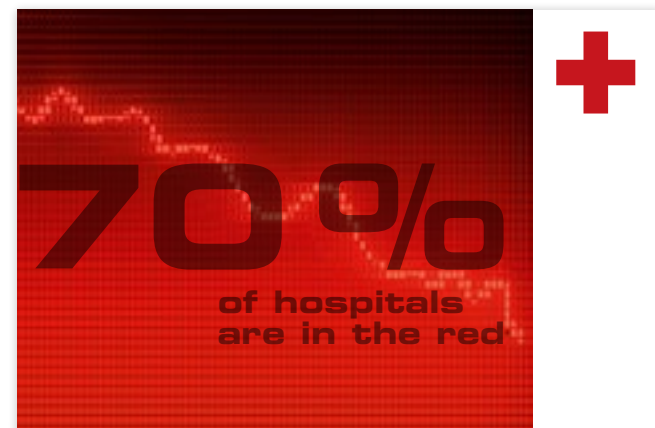
The 'Government Commission for Modern and Needs-based Hospital Care' ('Regierungskommission für eine moderne und bedarfsgerechte Krankenhausversorgung') has analysed this for three disease areas: cancer, strokes and joint replacement. It has concluded that if patients were treated in hospitals specialising in these diseases, they would have considerable advantages, e.g. 20,000 additional years of life for cancer, and a 23% higher chance of survival for breast cancer. In the case of strokes, almost 5000 more people would be saved.

If all hospitals do everything themselves, this results in 'quality deficits, increased morbidity and mortality, as well as comparatively high costs and less efficient staff deployment', according to the commission. By contrast, concentrating the treatment of patients in hospitals with specialisations increases quality and the provision of basic services, it says.

*Held on 21 June in Berlin by the German Federal Ministry of Health in collaboration with Jochen Lennerz, Harvard Medical School.

The EU wants to take economic pressure off hospitals.

As part of the Data for Health Conference 2023*, experts from the USA and Europe discussed the framework conditions and opportunities for utilising health data within and beyond European borders. This is because 70% of hospitals are in the red. The last few years have revealed the enormous value of data. In the healthcare sector, widespread use of scale data has improved medical knowledge – thanks in part to artificial intelligence technologies.

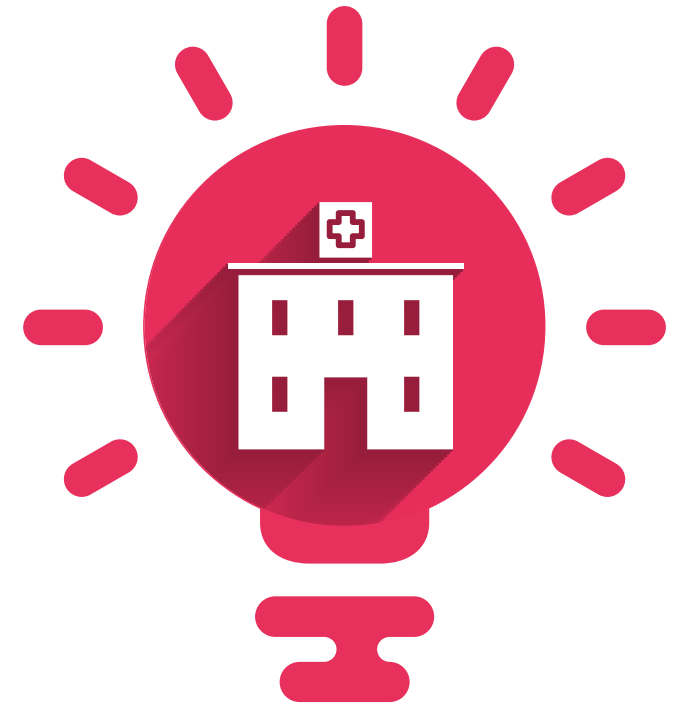


Energy-efficient upgrading brings huge cost savings.

The cost pressure on hospitals is increasing enormously. As hospitals are considered to be among the most energy-intensive buildings, massive savings in operating costs could be made by reducing the consumption of primary energy through an energy-efficient technical building upgrade.

In most cases, however, not enough funds are available to invest in the energy-efficient refurbishment of buildings, the vast majority of which were built in the seventies or eighties. Investments in medical technology generally take precedence.

The result of this is that older hospitals no longer meet any of the current standards of the Energy Saving Ordinance (EnEV). As a way out of this dilemma, many hospitals are beginning to implement the long overdue refurbishment by means of an Energy Performance Contracting project. Doing so can generally generate energy savings of up to 40% and result in substantial maintenance cost benefits. An energy-efficient refurbishment will pay for itself within five to ten years depending on the condition of the building. Once the term of the contract comes to a close, the operator can then enjoy all the benefits of the cost savings.



After educational facilities, healthcare is one of the sectors offering the greatest potential. If you include care facilities, the need for new construction and refurbishment of healthcare facilities in Germany alone amounts to roughly EUR 30 billion for the next six years. The latest EUROCONSTRUCT report also forecasts enormous potential.

Hospitals are among the most energy-intensive buildings.



How is the healthcare system changing on continents such as Asia and South America?

Asia

The changes in the healthcare sector in Asia are diverse and are influenced by various factors, including economic development, demographic change, technological progress and epidemiological trends. Some general trends and changes:



ASIA



1. Increase in non-communicable diseases (NCDs):
Asia is experiencing an increasing prevalence of non-communicable diseases such as heart disease, diabetes, cancer and respiratory diseases. This is partly due to changing lifestyles, eating habits and demographic change.



2. Ageing of the population:
Many Asian countries are facing the problem of a rapidly ageing population. This is leading to an increase in age-related diseases and poses challenges for the healthcare system, particularly with regard to the provision of long-term care and age-appropriate healthcare services.



2. Increase in infectious diseases:
In parallel with the rise in NCDs, infectious diseases remain an important health concern in some regions. New or re-emerging infectious diseases, such as outbreaks caused by viruses, continue to pose a challenge.



4. Digitalisation in the healthcare sector:
The use of information technology and digital healthcare solutions is increasing in many Asian countries. Telemedicine, electronic health records and healthcare apps are becoming more important when it comes to improving access to healthcare services.



5. Medical tourism:
Some Asian countries are developing into important destinations for medical tourism. Patients from other countries travel there to receive high-quality medical care at low cost.



6. Health policy and system reforms:
Many countries in Asia are reforming their healthcare systems to ensure better care, affordability and efficiency. This may include introducing universal health insurance, expanding basic services and strengthening prevention.



7. Research and development in the healthcare sector:
Some Asian countries are increasingly investing in research and development in the healthcare sector in order to obtain innovative medicines, treatments and technologies.

It is important to note that developments in the healthcare sector can vary greatly from country to country as the healthcare systems and demographic profiles vary. However, these trends underline the need for adjustments to meet changing health requirements.

Tough requirements for ventilation and air conditioning.



Ventilation and air conditioning systems in hospitals must ensure that the contamination of air with micro-organisms is reduced to a minimum and that strict limits are not exceeded. Moreover, dust, anaesthetic gases and odorous substances must be contained. This applies in particular to operating theatres, intensive care units, delivery rooms and neonatal units.



TROX components, units and systems in a hospital:

- | | |
|---|--|
| 1 Air handling units | 10 Disc valves (exhaust air) |
| 2 Operating theatre ceiling with high-efficiency particulate filter | 11 Circular silencers |
| 3 particulate filter air terminal devices | 12 Fire dampers (KU-K30) with air diffuser |
| 4 Fire dampers with TROX O _x | 13 Multileaf dampers |
| 5 Volume flow controller with EASYLAB | 14 Smoke control dampers |
| 6 Swirl diffusers | 15 X-FANS smoke exhaust fans |
| 7 Volume flow controller with TROX O _x | 16 X-FANS smoke exhaust fans for roof installation |
| 8 Jet nozzles | 17 X-FANS jet ventilation system |
| 9 Ventilation grilles | 18 RadioDuct |



Dr Thomas Hermann Voshaar, pulmonologist.

Profile:

Chief physician for pulmonary and bronchial medicine and allergology at Bethanien Hospital, Moers since 1993. His goals included practising human-centred medicine. He defined this through such attributes as sincerity, respect and recognisable care.

Dr Voshaar's focus was on bronchial asthma and pulmonary emphysema as well as the development of a new procedure for the early diagnosis of occupational diseases and an inhalation procedure. He recognised and confirmed the airborne transmission of coronaviruses at a very early stage of the pandemic.

After 30 years, he went into a well-deserved retirement in October 2023.

Dr Thomas Hermann Voshaar.

'I can only agree with the appeal for healthy indoor air quality. In my 30 years working as a pulmonologist in Moers, we have always taken care to create a healthy indoor climate. TROX has always been there to advise us. Particularly during the coronavirus pandemic, effective ventilation and air conditioning was shown to make a significant contribution to the health of our patients, as well as maintain the health of all staff.'

Essentially, the ventilation and smoke extraction technology must perform the following important tasks:

- Limit the concentration of microorganisms in the room air, particularly in protection zones (operating theatre, instrument trolley, lab)
- Ensure the necessary air change and maintain stringent room air conditions (differential pressure, temperature and humidity)
- Limit the concentration of contaminants in the occupied zone
- Prevent the spread of fire through the use of fire dampers and TROX O_x
- Prevent the spread of smoke through mechanical smoke extract systems

Perfect ventilation and air conditioning not only offer a high level of hygiene and safety while improving the quality of the room air and helping patients to recover more quickly, they also increase the productivity of the staff. These are aspects that bring financial advantages to those who run hospitals. For hygiene reasons, only a one-directional airflow is allowed in specific rooms, i.e. from sterile areas with a minimum germ count to less sterile areas where

the requirements are not quite as demanding. TROX provides intelligent components and systems for measuring and control technology that maintain this flow direction through different supply and exhaust air volume flows.

In Germany, all production facilities and non-residential buildings consume almost three quarters of the primary energy required nationwide (as of 2020). RadioDuct enables buildings in need of refurbishment to be upgraded thanks to radio-based components, so that demand-based operational management can be achieved even if the communication infrastructure is inadequate. Due to their waveguide properties, the existing ventilation ducts of the ventilation and air conditioning systems can be used for wireless radio transmission. This makes it possible to implement demand-based operational management without any great effort and use existing components and systems in an economical and resource-saving way. The radio duct technology is patented by TROX.

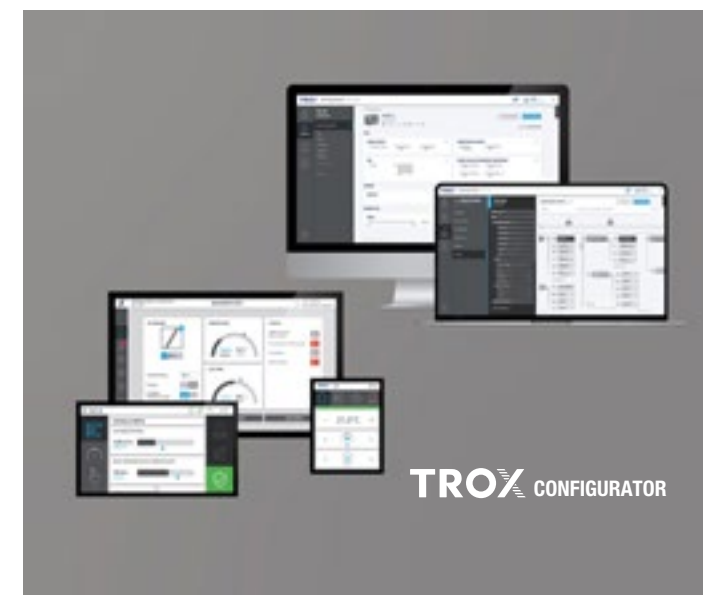
Looking to the future: TROX O_x – the standardised digital system solution.

TROX O_x is a unique system solution that is ideal for hospitals and clinics. TROX O_x brings together the diverse requirements for safety and comfort in buildings in a standardised digital system for the first time. This is based on the new TROX CONFIGURATOR and new TROX O_x components.

The TROX CONFIGURATOR allows central and integrated planning of aspects including fire protection and ventilation technology over several levels, right down to the individual room. A configuration wizard supports the selection and design as a virtual assistant.

New TROX O_x components form the intelligent interfaces and manage different TROX solutions. Simple integration into a central building management system is also possible via various bus systems. Operation and management are carried out via smart touch displays or, optionally, via the integrated web browser. Trend data, alarms and maintenance messages can be viewed centrally here.

TROX O_x reduces interfaces between the different applications and components, and significantly simplifies installation and commissioning. All components can be integrated quickly and effortlessly via plug and play. TROX O_x is a scalable system suitable for both new buildings and refurbishments.



Facts and figures on hospitals.

The development of medical care has produced some special results worldwide. Like the largest hospital in the world: the Texas Medical Center in Houston, which forms an entire city district with over 60 medical institutions. The massive healthcare complex treats more than seven million patients per year. The doctors perform over 1000 operations a day.



1st place for 'best healthcare system': Singapore.



2nd place for 'best healthcare system': Japan.



1st place for 'best hospitals': Mayo Clinic, Rochester, USA.



11th place for 'best hospitals': Charité – Universitätsmedizin, Berlin.

Which countries have the best healthcare systems?

In 2023, Singapore took first place with a health index of 86.9, followed by Japan and South Korea. The health index is based on people's state of health and access to the services and facilities that are needed to maintain and improve health.

Source: Statista.

According to the Irish writer Jonathan Swift (1667–1745), the best doctors in the world are Doctor Diet, Doctor Quiet and Doctor Merryman.

Countries with the best doctors in the world.

Rank	Country
1	USA
2	UK
3	Germany
4	France
5	Switzerland
6	Canada
7	Italy
8	Australia

Source: praktischArzt.

The 'best doctor in the world' according to Usain Bolt.

Dr Müller-Wohlfahrt keeps everyone going. Usain Bolt came to his practice as a 16-year-old and went on to become Olympic champion eight times. When Bolt won the 100 m final in 9.63 seconds at the 2012 Olympics in London, the Jamaican superstar said: 'He is the best doctor in the world.' Paula Radcliffe was his patient for 17 years; she won the London and New York marathons a total of six times and held the world record for several years, with 2:15:25. Radcliffe says: 'A lot of athletes know about him. He is someone they trust.' Boris Becker, Katarina Witt and Cristiano Ronaldo, as well as Bono, Luciano Pavarotti, Thomas Gottschalk and Bruce Springsteen, have been or are still his patients.



Usain Bolt is a Jamaican former sprinter and so far the only person to have run the 100 m in less than 9.6 seconds.

Accessibility and quality of healthcare (%)



Source: Medical Air Service

Ranking of the best hospitals.

Rank	Hospital	City, country	Outstanding category
1	Mayo Clinic	Rochester, USA	Artificial intelligence, robotics
2	Massachusetts General Hospital	Boston, USA	
3	The Johns Hopkins Hospital	Baltimore, USA	
4	Cleveland Clinic	Cleveland, USA	Artificial intelligence
5	The Mount Sinai Hospital	New York, USA	Digital imaging, artificial intelligence
6	Brigham and Women's Hospital	Boston, USA	Electronic functionalities
7	MD Anderson Cancer Center	Houston, USA	Electronic functionalities
8	Memorial Sloan Kettering Cancer Center	New York, USA	Electronic functionalities, robotics
9	Karolinska Universitetssjukhuset	Solna, Sweden	Artificial intelligence
10	Houston Methodist Hospital	Houston, USA	Digital imaging, artificial intelligence
11	Charité – Universitätsmedizin	Berlin, Germany	

Source: KU Gesundheitsmanagement 2022.



Canadian Sir William Osler (1849–1919) is considered the father of modern medicine.



Medical tourism.

Medical tourism is a colloquial term that refers to the use of medical treatments across countries. Medical tourism is a global trend that is seen as one of the consequences of increasing globalisation. Every year, more than 23 million patients around the world travel abroad. The annual turnover for medical tourism is around EUR 80 billion (as of 2019).

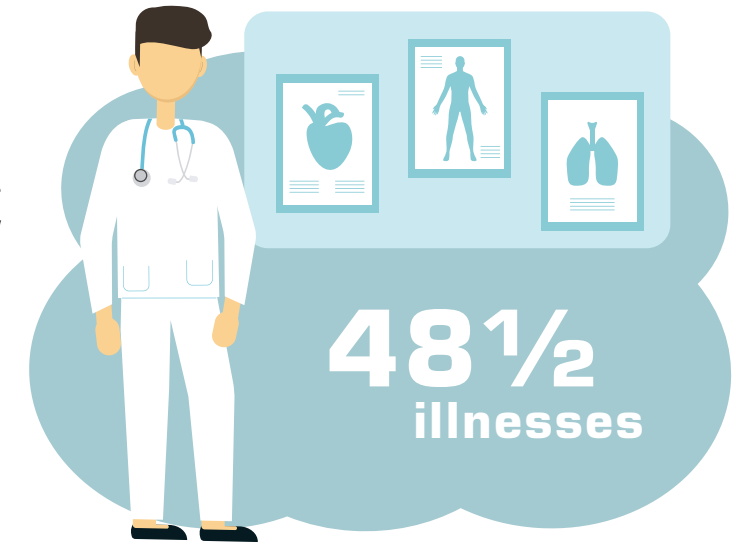
- Two thirds of all medical trips take place within Asia. Hundreds of thousands of patients from abroad are treated every year in India, Thailand, Singapore, Malaysia, South Korea and the Philippines.
- Germany is also a favoured destination for medical tourists, particularly from the EU, the Commonwealth of Independent States and Arab countries.
- Recently, Turkey has also been heavily recruiting patients from abroad, partly with the help of the Ministry of Tourism. In 2021, 642,444 people travelled to the country for a medical procedure.
- Around 40 countries are actively recruiting patients from abroad, including the USA, Germany, Switzerland, Mexico, Costa Rica, Israel, India, Thailand, South Korea and Singapore.

Sources: Glasgow Research & Consulting, Clinicspots.com, Wikipedia.

Incredible.

The woman with 48½ illnesses.

A patient with back pain went for an MRI. Two radiologists specialising in the spine made 25 findings, including a vertebral fracture and two constrictions in the spinal canal. The woman – a guinea pig for researchers – toured through a further ten radiology centres. The results were not encouraging. By the end, the patient had 48½ pathological findings.



Sniffing out a diagnosis.

Dogs are known to have astonishing diagnostic abilities. Some can smell certain cancers, presumably because cancer cells produce special substances that can be sniffed out. Others, like golden retriever Polly, have reliably detected pregnancies. Polly made this known by sniffing around the pregnant woman's lap even before she had announced the happy news herself.

At Medical Detection Dogs in Milton Keynes in the UK, dogs are trained to detect various human diseases. Their refined noses can smell when a person has cancer, malaria or Parkinson's disease. They also have a nose for diabetes. The animals are taught to recognise hypoglycaemia and hyperglycaemia and then respond accordingly.

Diabetic alert dogs are usually trained as assistance dogs for 18 to 24 months. They can also reduce the risk of secondary diseases and enable diabetics to lead an almost normal life.

Architectural psychology: how the built environment affects health and well-being.



Psychologist Tanja Vollmer and architect Gemma Koppen have dedicated themselves to the topic. 'I feel hemmed in.' Or: 'I'm standing in front of a wall.' Tanja Vollmer has often heard these descriptions from cancer patients in her time as a clinical psychologist at the LMU Klinikum at the Ludwig Maximilian University of Munich, Germany.

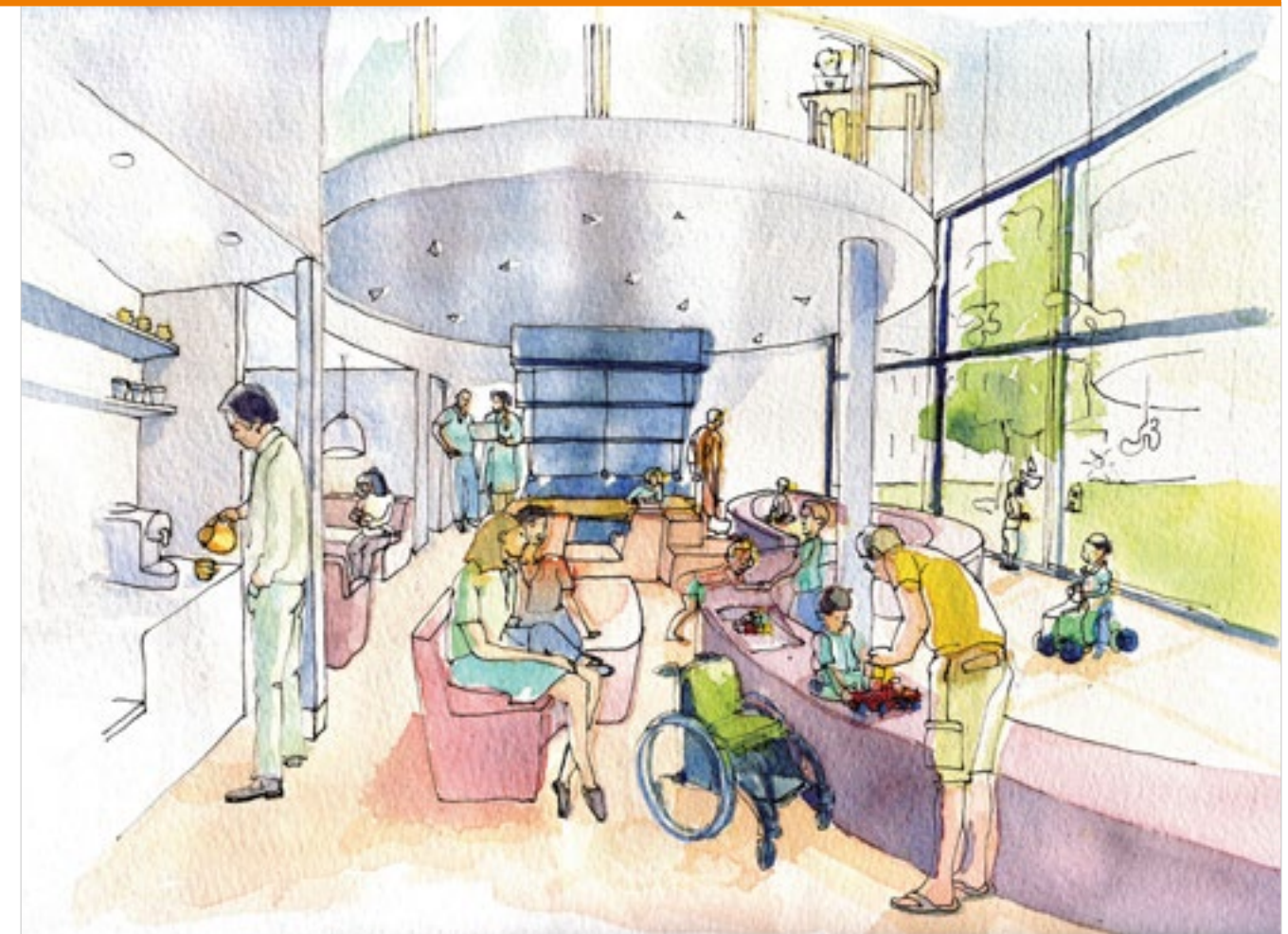
At her architectural practice Kopvol architecture & psychology, the architects learn to interpret psychological studies correctly and use the results in their design decisions.

Health and architecture.

The Rotterdam Study, funded by the Dutch Ministry of Science, laid the foundation for her projects. They followed around 500 patients and their relatives in all oncological clinics in the Netherlands on one treatment day. On the various wards, they repeatedly carried out psychological interviews and physiological measurements. The results showed that sick people perceive the rooms differently to their carers, experiencing them as narrower, darker and more frightening.

Princess Máxima Center for Pediatric Oncology: hospital with parent-child room.

The study opened the door to Kopvol's first major joint project. When the new Princess Máxima Center for Pediatric Oncology was built in Utrecht, it created an environment with high medical standards in care, research and training in the field of cancer medicine and cancer care where patients feel comfortable. Kopvol developed the building concept. A key pillar is the OKE (Ouder-Kind-Eenheid = parent-child unit), an innovative room typology, 7 m² larger than the previous patient room: Parents are given an area of the room that is separated by a sliding panel where they can withdraw and even work while still being able to see and hear their child. The aim of this partition is to promote family satisfaction and reduce stress.



Source: Artist's impression of the anti-waiting room at the new Paediatric and Adolescent Clinic Freiburg ©Kopvol architecture & psychology, 2013.

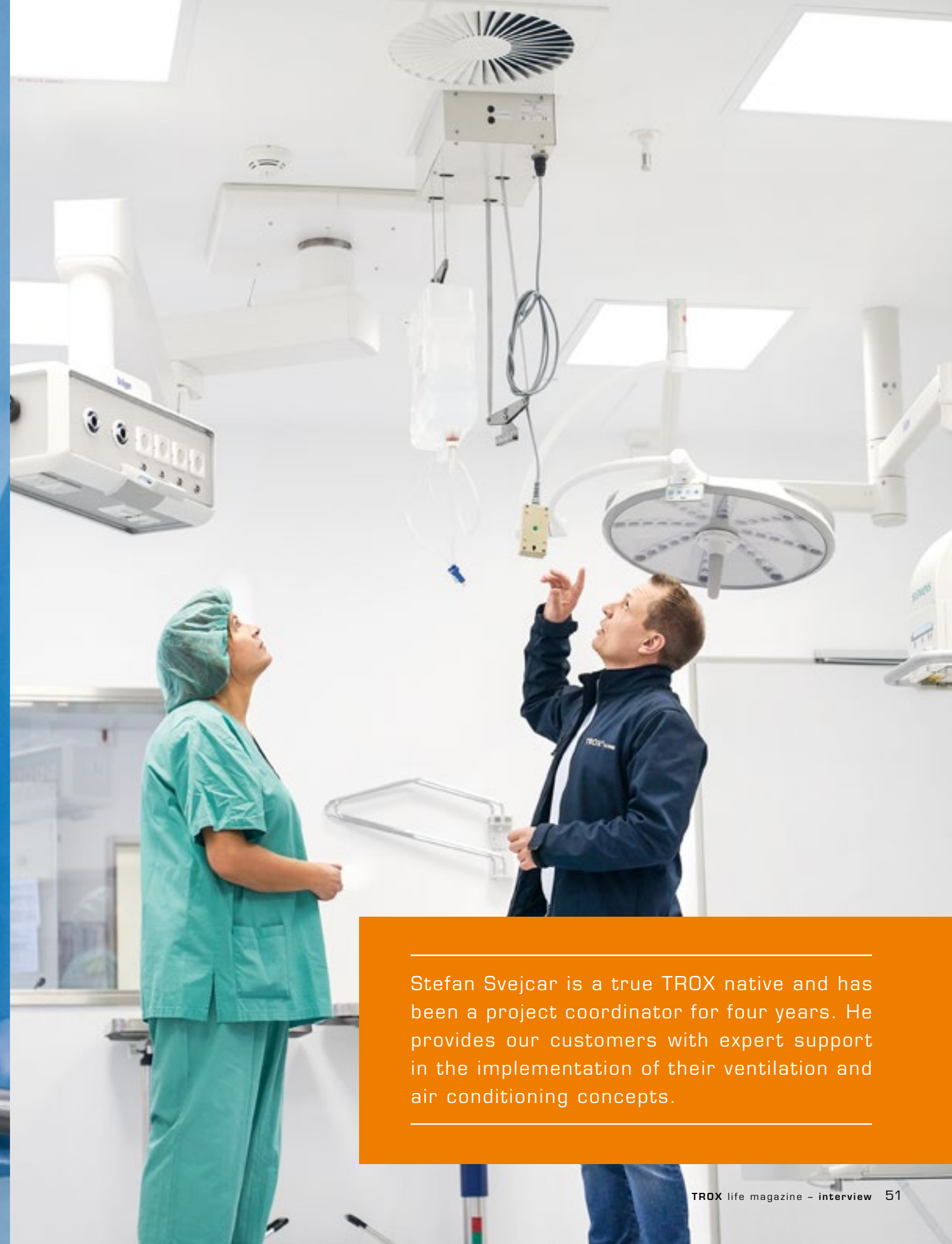


Freiburg Paediatric and Adolescent Clinic.

The new Paediatric and Adolescent Clinic in Freiburg im Breisgau, Germany, was designed along the lines of the Princess Máxima Center. The medical director and her team were convinced: 'A paediatric clinic is more than just a floor of a ward block where a room has been turned into a play area.' The rooms also need to be arranged in such a way that they make work sequences easier and meet the needs of all users.

Doctors and nurses had a vision of a new building that would bring together all the specialist disciplines of paediatric and adolescent medicine, standard clinical care and comprehensive emergency care under one roof. They founded a support association, wrote a qualitative room data sheet for the decision-makers and then commissioned Kopvol to develop qualitative room concepts. The Kopvol concepts drew on findings from the Rotterdam Study as well as experiences with the new building in Utrecht and were provided to the applying offices and the jury in the subsequent tendering and planning competition.

Stefan Svejcar in conversation.



Stefan Svejcar is a true TROX native and has been a project coordinator for four years. He provides our customers with expert support in the implementation of their ventilation and air conditioning concepts.



CAREER:

Since January 2020

Project coordinator, TROX GmbH

August 2015 – December 2019

Project manager, ventilation technology, K&S Gesellschaft für Gebäudetechnik mbH

2009 – August 2015

Construction mechanic in research and development, TROX GmbH

August 2010 – June 2014

Mechanical engineering, Moers Vocational College for Technology

February 2007 – September 2009

Construction mechanic, TROX GmbH

September 2003 – January 2007

Apprenticeship as construction mechanic, specialising in thin sheet metal construction technology, TROX GmbH

Mr Svejcar, the concept of systems is becoming increasingly important in air conditioning and ventilation. What does ‘system’ mean to you at TROX?

We are in the process of turning from a component manufacturer into a system provider. If we remember that we spend about 90% of our lives indoors and the air that we breathe is crucial to our well-being, it quickly becomes clear that comprehensive, sustainable and safe solutions in the field of air conditioning and ventilation are extremely important.

To make this possible, we network our components and sub-systems into a single unit, or a system, to create a functioning whole. The focus is on functionality, safety, energy efficiency and sustainability.

The synergies that result from this networking process bring about further advantages for our customers.

We can achieve lower construction costs, reduce the number of interfaces required and enable shorter, effective implementation periods. Our aim is to achieve precisely this balance between functionality, effort and cost.

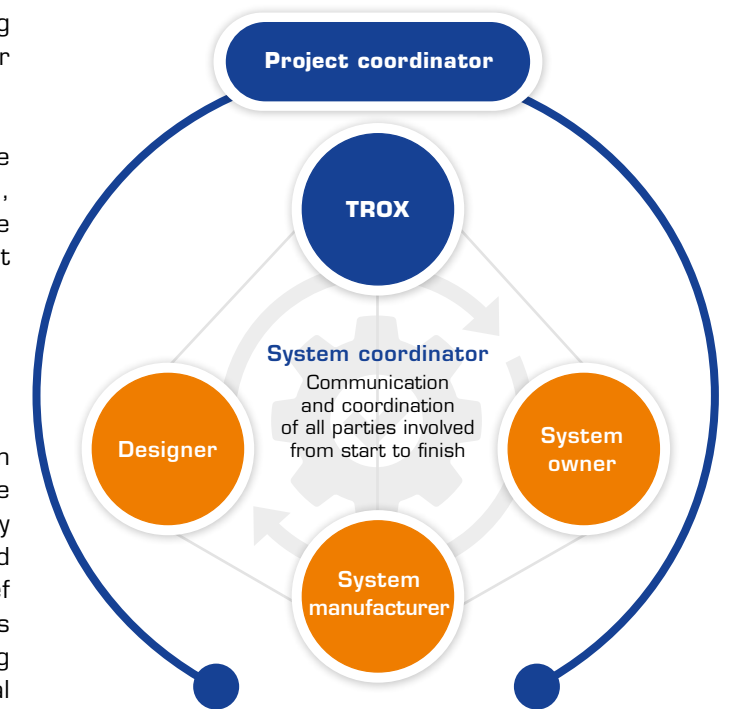
What does a project coordinator do?

As the name suggests, we coordinate a system project from start to finish. In other words, we support our customers right from the preliminary phase of planning, we develop ideas and we find individual solutions, such as in Moers for the St. Josef Hospital. (see p. 10). The coordination of logistics also plays an important role in this regard, including just-in-time delivery or the identification of logistical problems. When delivering over 25 air handling units for the Charité in Berlin, we first had to make sure there was an adequate opening for bringing them into the building and the air handling units had to be supplied in the order of installation. Finally, we coordinate the air conditioning and ventilation concept together with the planning office and support the system manufacturer during the installation of the system.

How exactly do you ensure a project is coordinated smoothly?

This is only possible as a collective! We work closely together, communicate with our customers as early as the design stage and develop initial solutions tailored to their requirements. Due to the on-site requirements, it may be necessary, for example, to make adjustments to our standard X-CUBE programme. These project-related additional functions are defined accordingly, factored into the costs and implemented in cooperation with the programmers from TROX HGI as the project progresses.

As part of the implementation work, we provide direct support in the event of queries to relieve the



The tasks of a project coordinator include:

- Customer communication
- Detailed planning support
- Developing individual ideas and solutions
- Coordination of the air conditioning and ventilation concept
- Definition and coordination of any special functions
- Coordination of individual programming
- Reduction of interfaces
- Ordering support
- Execution support
- Coordination of logistics
- Providing system training
- Implementation of on-site modifications
- Participation in site meetings
- Ensuring smooth implementation

workload on the designer, for example, as well as the project managers at the system manufacturer. We offer project-specific concepts and system training, provide help when ordering the necessary system components, give support during implementation of on-site modifications, take part in site meetings and much more. Our aim is always to minimise the interfaces as far as possible and to enable a smooth implementation process.



Coordination ensures that complex system projects are implemented efficiently and successfully.

The project coordinator acts as the interface between the customer and TROX, mediating between sales, engineering, order processing, TROX X-FANS, TROX HGI and the customer. That means the customer only has one contact person.

You are currently working on the hospital project in Freudenstadt. A new fire protection and smoke extraction control system is being implemented there. What are the challenges of this project?

We had to respond to the market situation in terms of lead times for electronic components so that we could meet the targeted completion date. Together with TROX HGI, the designer and the contractor, we worked out a plan B.

Part of the plan was that the programming of the fire protection and smoke extraction control system was in our hands and no longer done externally. This has created a new foundation so that simpler and faster adaptations can be made for other projects with their own requirements.

You have now been working for TROX again for around four years. What makes TROX SPECIAL?

I started my career at TROX with an apprenticeship as a construction mechanic. Togetherness plays a major role here: always being open, honest and goal-orientated, even when faced with difficult challenges. The interesting part is the opportunity to help shape processes.

TROX has given me the opportunity to continuously develop, both professionally and personally.

Do you have a project that you are particularly proud of?

I am proud of all the projects! But if one stands out, it's the Weitblick 1.7 building project, as it was the first system project that I managed. The building project comprises a five-storey building including attic space and an underground car park with two levels. Seven X-CUBE units with the X-AIRCONTROL and AS-i interfaces were installed. The X-TAIRMINAL management system for ventilation systems provides the visualisation. TROX X-FANS provide smoke extraction from the two garage floors in the event of a fire (30,000 m³/h each), with six axial-flow fans in total (4 x 11,000 m³/h and 2 x 8000 m³/h).

The X-CUBE units are equipped with an integrated control unit with CO₂ control and time programme. A manual control panel enables third-party use of the garage for FC Augsburg home matches, which relieves the heavy traffic travelling to and from the stadium.

Which project presented you with the greatest challenges?

The five-storey ward block at the St. Josef Hospital in Moers, which is being refurbished while hospital operations are ongoing. The core refurbishment of the ward block is being carried out in stages. The process is starting on the fifth floor. The other floors will follow one by one, but in an unknown order. For this reason, a combination of conventional wiring and RadioDuct, the radio-controlled control system from TROX, is being used in the building. This solution was what presented the challenge.

The challenge lies in the wired networking of the X-AIRCONTROL components with each other and with the ventilation unit via the master. The AIRCONTROL zones are usually connected in series using flat telephone cables with RJ12 plugs at both ends. Since the cable guides are not fixed until each floor is renovated, our wireless system solution RadioDuct is being used to avoid increased wiring and long cable routes. Following the successful implementation of the first construction stage, we were also able to support the construction of the new urology department and create a comfortable environment for patients with an additional system.



What are the features of the radio-controlled RadioDuct control system?

An energy management system is essential to energy-efficient operation. All energy conversion, distribution and transfer systems, as well as the control components, must have a data connection to the energy management system to enable demand-based operations management. In existing buildings, this communication infrastructure has often not been installed and retrofitting it is very costly or not even possible with conventional wiring.

It seems to be becoming clear that there is enormous potential in the RadioDuct system.

In fact, it offers incredible opportunities to undertake energy-efficient refurbishments, particularly in existing buildings, that result in energy savings of up to 40%: a huge contribution to sustainable economic activities in all areas of building air conditioning. The healthcare sector in particular offers great opportunities to relieve the cost pressure on hospitals (see p. 26).

Mr Svejcar, thank you for your time.



► **Stefan Svejcar**

The questionnaire was developed by Marcel Proust and popularised in Germany by the FAZ newspaper. We use it to ask quick-fire questions about people's likes and dislikes.



GETTING PERSONAL

Where would you most like to live?

By the sea.

What does real happiness mean to you?

To simply enjoy a beautiful moment.

What kind of mistakes are you most likely to forgive?

Mistakes are not bad as long as you learn from them.

Your favourite fictional heroes?

To be honest, I don't have a real fictional hero.

Your favourite historical figure?

Thomas Edison.

Your favourite composer, musician or band?

I like a wide range, as long as it's real music. And if it rocks, then turn it up.

What's your favourite pastime?

Definitely spending time with my daughter. Otherwise, I like travelling, going to concerts and watching football.

What's your favourite food?

I discovered sushi a few years ago. I also really like grilled food.

Which qualities do you most value in friends?

We are there for each other, understand each other intuitively and can also let things pass.

What's your biggest weakness?

I'm sometimes fussy about details and impatient at the same time.

What would be the worst thing that could happen to you?

Apart from a bad stroke of fate: when the body can no longer do what the head wants.

What's your favourite colour?

Blue.

And your favourite flower?

I don't really have a favourite flower, but I really like colourful blossoms.

Your favourite animal?

In terms of pets, it's dogs, otherwise I find sharks fascinating.

Your favourite book?

Quake by Richard Laymon.

What motto do you live by?

There is always a solution.

Indoor air quality in the healthcare sector

Sustainability and well-being with TROX TFM ceiling tiles.

Hospitals are places of healing, palliation and recovery. They are designed to be places of rest, to allow patients to recover from an illness or operation and reduce stress and pain.



Hospital buildings should protect patients and the people who work there, both mentally and physically. Hygiene standards must be meticulously observed, and the rooms should create a certain feeling of comfort through temperatures that suit the activity and a good air quality.

It is not just in times of a pandemic that hospitals and healthcare buildings come under the microscope. Patients and the people working in these buildings must be given the maximum protection against infection. With respect to air filter systems, it is not just hygienic aspects that need to be considered here; air routing, energy efficiency and a climate of wellbeing that can be adjusted if possible are all factors that are equally important. Whether we are referring to operating theatres, treatment and waiting rooms, or to care and isolation rooms, the highest safety measures with regard to air hygiene and quality are essential in hospitals.

Operating and examination rooms have special requirements with regard to air cleanliness and disinfection, and so do postanaesthetic recovery rooms and resuscitation rooms. It is not always clear which methods and technologies should ideally be used in these rooms, since well-being and energy efficiency need to be harmonised – and this presents managers with many different challenges.

Thermal comfort for well-being.

Whether in the operating theatre, radiology, orthopaedics, gynaecology, dialysis, cardiology or gastroenterology, undressing the patient is often essential to ensuring adequate examinations or treatment. Well-being is particularly important at these times: for the patient, who may be unused to this situation and could find it unpleasant, and for the doctors and care personnel, who need to do their job very close to the patient.

Thermal comfort plays a key role here. During examinations and treatment, patients usually have to lie down and are therefore restricted in their activity. However, they also need to be relaxed at the same time and should not be allowed to freeze, which is why they need an appropriately regulated air temperature that provides comfort.

On the other hand, doctors and nursing staff have different requirements for a comfortable temperature due to their increased level of activity – with maximum protection against viruses, bacteria and other pathogens. And not only in times of coronavirus.



The TFM modules and the TFM ceiling tile.

TROX has developed the TFM series for precisely these applications. It is made up of individual filter-ceiling modules that can be combined into a complete ceiling tile as desired.



Ceiling tiles of any size can be created from individual TFM modules using the modular principle.

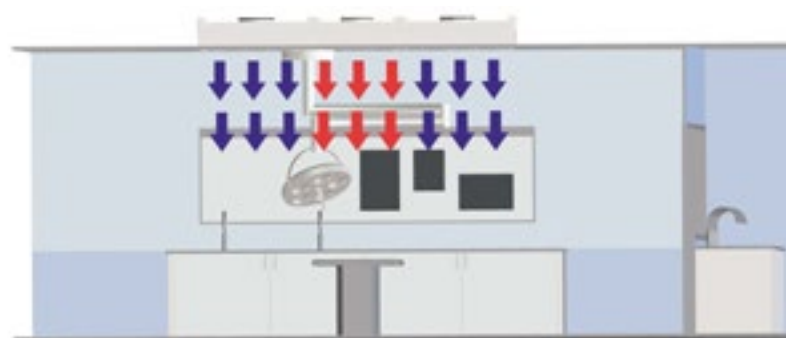
With a TFM ceiling tile, the area in which the patient is positioned during treatment can be kept at a higher temperature than the area for medical staff. For this purpose, the inner segments of the ceiling tile are subjected to a higher air temperature than the outer segments. This could be implemented as follows: The outer, 'cool' TFM modules receive treated and pre-filtered supply air from a central ventilation system. The internal 'warm' modules can be supplied with warm room air that is extracted as exhaust air from surrounding rooms and subjected to high-quality filtering in the TFM module.

The design of the TFM ceiling tile minimises air mixing between temperature zones.



The specific design of the module from an aerodynamic perspective, the use of HEPA air filters and an appropriate perforated plate for the supply air ensure a stable, vertical, turbulence-free airflow with air speeds ranging from 0.3 to 0.5 m/s. This reduces any mixing of air between the temperature zones to a minimum, which means an individually controlled heat zone inside the ceiling tile is implemented in an effective and draught-free way (see fig. in bottom left).

TROX is the only supplier to provide a complete ceiling system: both air routing and filter technology. For the highest demands on air purity and quality as well as comfort.



Zones located below a TFM tile can be supplied with supply air at different temperatures.

Advantages at a glance:

- Individual casings can be combined in a modular solution to form ceiling tiles
- Easy, time-saving and secure filter change due to special press-in frame
- Suitable for mounting filters with flat or fluid seal
- With sealing integrity test facility for filter elements
- Integrated differential pressure measuring points
- Internal measuring tube to sample particles for measurement
- Spigot with lip seal
- Flexible suspension
- For air cleanliness classes 5 to 8 according to EN ISO 14644-1
- Meets the hygiene requirements of VDI 6022

Environmental Product Declarations (EPDs) – now available for many TROX products.

An Environmental Product Declaration (EPD) is a standardised document that presents all the environmental impacts of a product over its entire life cycle. It provides transparent information about resource consumption, emissions and other relevant key figures.

EPDs can be used in a variety of ways, e.g. by building designers and architects as a basis for decision-making for the sustainable planning and assessment of buildings. Environmental Product Declarations can promote environmental awareness and contribute to more sustainable actions.

An EPD is a type III environmental declaration that is verified and published for TROX products by EPD Norge. The partnership with ECO Platform, an umbrella organisation of national EPD programme holders, enables the EPDs to be used throughout Europe. The basis for creating an EPD is a valid Product Category Rule (PCR), which defines the calculation rules and framework conditions for the product to be presented in an EPD.

From March, TROX will make the documents available on the respective product pages and on a dedicated microsite with interesting background information on the topic of EPD.

Further information can be found here:



Example TROX products with EPD:

Multileaf damper JZ-AL
NEPD-5633-4930-EN

Fire damper FK2-EU
NEPD-5682-4950-EN

Volume flow controller RN200
NEPD-5550-4859-EN

Air handling unit X2 Nordic
NEPD-5699-4998-EN

Smoke control damper EK2-EU
NEPD-5612-4913-EN

Fire damper FKRS-EU
NEPD-5681-4953-EN

Splitter silencer XS
NEPD-5634-4937-EN

Ceiling swirl diffuser VDW
NEPD-5501-4818-EN

Pocket filter PFG
NEPD-5559-4854-EN

Smoke exhaust fan BVD
NEPD-5846-5133-EN

epd



The new KS Filter production facility in the Czech Republic.

TROX KS FILTER

replacement business can be further expanded through this investment. For filters as the core business within the TROX GROUP, this development is of huge importance.

TROX KS Filter: new production facility opened.

On 12 December 2023, TROX opened the new TROX KS Filter production facility in Pribram, Czech Republic. The opening marks the end of a one-and-a-half-year phase of intensive planning and construction. The factory in Pribram is the second largest TROX production facility in the EMEA region. In 2024 alone, 100 new jobs will be created there. The ceremonial opening of the new production facility is therefore not only a milestone in the company's history, but also makes a significant contribution to strengthening the regional economy.

Together with the existing property, an area of approx. 24,000 m² is available for the production and supply of filter elements for all types of industrial solutions.

Udo Jung, TROX Managing Director of Sales, Engineering and Production, reported on the huge significance of filter technology in the TROX GROUP at the opening ceremony in the presence of many customers and managing directors from the relevant filter markets. According to Jung, with the acquisition of TROX KS Filter in 2019, TROX has taken a major step towards its goal of strengthening its presence in Eastern Europe. He added that the construction of the new production facility in Pribram is a central investment measure and will take significant pressure off the German factories, which have limited capacities.

Thomas Mosbacher, TROX Managing Director for Finance and Human Resources, together with Thomas Klamp and Igor Vlk, Managing Directors of TROX KS Filter, presented the upcoming plans on site. Around 150 new jobs are to be created by 2025 in the town, which is located in the Central Bohemian Region and has a population of around 35,000.

Jan Konvalinka, mayor of the town of Pribram, was delighted and promised to offer his support in the search for new employees. A public bus stop may even be planned for the new building, he said.

TROX invests in filter technology.

For TROX, filter technology plays a fundamental role as the lungs in the organism that is a ventilation and air conditioning system. Powerful filter systems clean the ambient air that is drawn in by the central unit and thereby maintain a healthy indoor air quality. This is why TROX endeavours to develop comprehensive and coordinated systems. TROX is therefore the only company in a position to provide comprehensive solutions for the various sensitive areas of a hospital.

Thomas Klamp, Head of the Filter Technology Division and Managing Director of TROX KS Filter, was responsible for setting up the plant in Pribram. He explains that expertise in filters and the filter

Thomas Klamp, Head of the Filter Technology Division and Managing Director of TROX KS Filter.



Igor Vlk, Thomas Klamp, Thomas Mosbacher, Udo Jung and Prof Dr Hans Fleisch (from left) turn the symbolic TROX key at the opening of the new TROX KS Filter factory.



TROX is creating jobs and strengthening the local economy with the new factory in Pribram.





Running at TROX!

TROX teams have competed in many large fun runs in Germany and abroad.



The Duisburg TARGOBANK Run.

The TARGOBANK Run has a long tradition. As one of the first company runs in North Rhine-Westphalia, it is a fixed sporting institution in Duisburg and the surrounding area. There is a festival atmosphere every year in August, when around 6000 runners line up in front of the opera house in Duisburg. The course of the TARGOBANK Run has a total length of 5.2 kilometres. The race starts and finishes in front of the Theater Duisburg in the city centre.

TROX was represented by 78 runners. They enjoyed the unforgettable atmosphere. Almost 20,000 spectators followed the participants on their way through Duisburg. With the final fireworks display in the evening, the TARGOBANK Run was not only a great experience for all the participating companies, but also for all the citizens of Duisburg who joined in the celebrations.

6000 starters at the TARGOBANK RUN in Duisburg – including 78 TROX employees.





25 TROX X-FANS employees took part in the traditional Lollslauf fun run in Bad Hersfeld.



The Lollslauf fun run at the Lullusfest.

Every October, the Lullus fire burns in Bad Hersfeld as a symbol of the Lullusfest. It is Germany's oldest folk festival. There are many different customs, and the festival tries to combine tradition and modernity every year.

Traditionally, the Lollslauf fun run takes place on the Sunday before the festival opens. This year, 3570 runners put their skills to the test in eight different competitions – 25 runners from the TROX X-FANS team took part in the 5 km team run and the 10 km team and individual run.

Background:

The Lullusfest is named after Archbishop Lull, who lived from 710 to 786. The festival has been held in memory of the founder of Bad Hersfeld and disciple of St Boniface since 852. The folk festival is famous and highly popular in eastern Hesse and takes place every year in the week that includes the date of Saint Lullus' death (16 October).

It attracts around half a million visitors and is traditionally opened by lighting a metre-high pile of wood. The Lullus fire in the market square also has its roots in a medieval custom: the 'Fierche', as the locals call it, was a symbol of 'Lullus freedom'. This refers to the exemption from the mandatory municipal taxes for the duration of the festival. The Lullus fire is a meeting place for many people and also serves as a source of heat for visitors on cold days.



The Trick or Treat Charity Run in Malaysia.

On 29 October 2023, the ASHRAE University of Malaya Student Branch held its well-organised annual Trick or Treat Charity Run. It was nice to see so many TROX Malaysia employees taking part and having a good time together during the run.



Trick or Treat Charity Run with TROX Malaysia employees.



1. TROX Brasil Run and Walk.



A strong team: the TROX Brasil football team.



1. TROX Brasil Run and Walk.

Our Brazilian plant in Curitiba was the starting point of the first TROX Brasil Run and Walk, which took place in August 2023. The event was very well received by the workforce, with many employees taking an active part.

The TROX Brasil football team.

The team has been playing on the football pitches of Curitiba for 30 years and has taken part in numerous external championships as well as internal tournaments with employees from the factory and administration. In 2012 and 2016, TROX Brasil won the external championships, and in 2023 the team even finished runner-up out of 54 teams. Congratulations.

The Comrades Marathon in South Africa.

Solicitor Manduwa (known to his colleagues as Solly) put in an impressive performance at the largest and oldest ultramarathon, the 88 km Comrades Marathon. Solly is an employee at TROX South Africa and finished this challenging marathon in 2022 in 8th place – out of around 16,000 runners! In 2023, he finished in 105th place despite breathing problems. He will compete again at the Comrades Marathon on 9 June 2024.



Solicitor Manduwa (Solly) finished 8th in the 2022 Comrades Marathon.

TROX France take part in three races.

Course Enfants sans Cancer.

Since 2012, the Children without Cancer charity run has taken place in September at the Domaine national de Saint-Cloud and the associated routes from Cuba and through Europe to Marseille. Thanks to 6200 runners and walkers, generous donors and many partners, a record cheque for EUR 2,310,000 was presented to the researchers of the Fight Kids Cancer European projects.



Course Enfants sans Cancer, Parc de Saint-Cloud, Paris.

Odyssea run.

At the run against breast cancer in September/October 2023, 40,000 participants covered a total of 278,000 km in the Bois de Vincennes and throughout France as part of the long-distance runs associated with Odyssea Paris. This raised EUR 805,000 for breast cancer research.



Odyssea run in Paris, Château de Vincennes.

10 km des Quais de Bordeaux.

Since 2004, volunteers from Bordeaux Athlé, the athletics department of the Stade Bordelais, have organised this French Athletics Federation event. The course takes in the quays of Bordeaux, the Pont Jacques Chaban-Delmas bridge, the Pont de pierre bridge and the Miroir d'eau reflecting pool, and serves as qualification for the French Championships.



10 km des Quais de Bordeaux.

Stay healthy with good nutrition!?

Overcooked pasta, barely any vegetables and a slice of grey bread for dinner: Meals in hospitals often have a miserable reputation.



**Risks and side effects:
hospital food.**

Hospital food is often a form of active euthanasia, says Gerhard Kocher. I can confirm this from my own experience. The food was made 40 km away, then delivered and warmed up. It was too salty, totally over-seasoned, overcooked and barely enjoyable.



A diet rich in vitamins promotes recovery, folic acid helps to heal wounds and vitamin C strengthens the immune system. By contrast, malnourishment in hospitals can lead to longer stays and even a higher mortality rate. This was the result of a Europe-wide study in 2006.



A healthy diet is particularly important for people who are ill. This is something that even Thomas Edison knew: 'The doctor of the future will give no medicine, but will interest his patient in the care of the human frame, in diet and in the cause and prevention of disease.' Recent studies have shown that poor food in hospitals can slow down the recovery process and even increase the risk of death. According to information from the Kontrovers political magazine show on German TV channel BR, huge savings have been made in recent years when it comes to patient food.

Prof Dr Hans Hauner, nutritional scientist at the Technical University of Munich, investigates patient food in his laboratory and has observed the massive savings made due to the current cost pressure in hospitals: 'Four to five euros per patient, per day are spent on food. Anyone can work out that this results in the lowest quality level.' Four to five euros spent on breakfast, lunch and dinner – how is anyone supposed to recover quickly and get healthy again on that?

<p style="font-size: 0.8em; color: red; margin: 0;">Medical science has made such tremendous progress that there is hardly a healthy human left.</p> <p style="font-size: 0.7em; color: white; margin: 0;">Aldous Huxley</p>	<p style="font-size: 0.8em; color: red; margin: 0;">Healthy citizens are the greatest asset any country can have.</p> <p style="font-size: 0.7em; color: white; margin: 0;">Winston Churchill</p>	<p style="font-size: 0.8em; color: red; margin: 0;">Flu sounds folksy. Influenza has something of an Italian beach about it.</p> <p style="font-size: 0.7em; color: white; margin: 0;">Werner Finck</p>
<p style="font-size: 0.8em; color: red; margin: 0;">The very first requirement in a hospital is that it should do the sick no harm.</p> <p style="font-size: 0.7em; color: white; margin: 0;">Florence Nightingale</p>	<p style="font-size: 0.8em; color: red; margin: 0;">Hospital food is often a form of active euthanasia.</p> <p style="font-size: 0.7em; color: white; margin: 0;">Gerhard Kocher</p>	<p style="font-size: 0.8em; color: red; margin: 0;">Breakfast at 6, lunch at 11, dinner at 5 – who can doubt that our hospitals are ahead of their time?</p> <p style="font-size: 0.7em; color: white; margin: 0;">Gerhard Kocher</p>
<p style="font-size: 0.8em; color: red; margin: 0;">Save one life, you're a hero. Save a hundred lives and you're a nurse.</p>	<p style="font-size: 0.8em; color: red; margin: 0;">The hospital system is healthy, but the healthcare system is sick.</p> <p style="font-size: 0.7em; color: white; margin: 0;">Gerhard Kocher</p>	<p style="font-size: 0.8em; color: red; margin: 0;">Manager's disease: an epidemic caused by the clock hand and transmitted by the diary.</p> <p style="font-size: 0.7em; color: white; margin: 0;">John Steinbeck</p>

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