

Health + Indoor Climate

Hospitals

Laboratories

Pharmaceutics



TROX[®] TECHNIK

The art of handling air

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TROX Head Office, Neukirchen-Vluyn (D)

TROX – international, innovative expertise in air conditioning and ventilation

At TROX, we have been developing and manufacturing air conditioning and ventilation components and systems since 1951. Consistent and continuous investment in research, development and production has made TROX the leader in the European market, a key player internationally, active throughout the world.

With its international competence, TROX is also an innovator for the specialised requirements found in hospitals, the pharmaceutical industry and laboratories.

Technology for comfortable air conditioning and ventilation in buildings – with the highest levels of hygiene and safety

TROX holds over 200 patents and registered designs in air conditioning and ventilation technology. The products are developed in in-house laboratories and manufactured in the highest quality. Their performance data are guaranteed by international testing institutes. Furthermore, the components from the entire product range have been hygiene-tested in accordance with the hygienic requirements stipulated in VDI 6022.

Client-orientated services are an integral part of the successful indoor ventilation and air conditioning solutions at TROX. They decidedly improve the profitability of real estate, throughout its entire period of use.

Clients profit from the field staff's competence and solution-mindedness during all phases of the product life-cycle, with regard to both new constructions and refurbishments and modernisation. With its extensive network of services, TROX CUSTOMER SUPPORT guarantees quick reaction times and short travelling distances during each stage.

TROX GROUP:

- ... 21 international subsidiaries
- ... 2700 employees throughout the world
- ... 12 production facilities in 10 countries
- ... 10 research and development laboratories
- ... Over 25 sales offices
- ... More than 50 agents and importers around the world

- ... Air diffusers
- ... Air-water systems
- ... Decentralised ventilation
- ... Fire and smoke protection
- ... Volume flow controllers
- ... Attenuators
- ... Filters
- ... Communication/automation systems
- ... Ventilation solutions for laboratories

TROX® CUSTOMER SUPPORT

TROX provides support for its clients during the engineering, procurement, assembly and operation of air conditioning and ventilation systems, during the entire life cycle of the system:

- ... Individual consulting for new constructions and refurbishments
- ... Product and programme selection
- ... Measuring/testing (flow, acoustics, performance)
- ... Project design
- ... Online order tracking
- ... Troubleshooting
- ... Online shop for spare parts
- ... TROX ACADEMY

The perfect room climate

Human beings spend about 80% of their lives in buildings. That is why it is important to create optimum conditions for a pleasant room climate – the quality of the air is the quality of life.

TROX understands exactly how to handle air. This know-how is crucial, especially in highly sensitive areas such as hospitals, laboratories and the production and packaging of pharmaceutical or chemical products.

People are our core concern:

- ... Patients who are operated on in hospital and recover in a good room climate, who receive medication developed and produced under hygienic conditions
- ... For staff operating under climatically comfortable conditions, manufacturing or undertaking lab tests without being exposed to toxic air



TROX solutions – for optimum air flow

Hospitals help people heal. So in addition to the clinical requirements, conscientious observance of hygiene is the top priority. This especially applies to sensitive areas such as operating theatres or the intensive care unit.

These cases need specialised ventilation technology

- ... Limiting the airborne microbial count in areas requiring special protection (such as the operation area and instrument table)
- ... Ensuring the designated air flow between the rooms
- ... Limiting the concentrations of anaesthesia gases and other substances in occupied zones
- ... Maintaining the required room air conditions (removing the thermal load and substance concentrations)

Research and Development at TROX has developed effective solutions for these areas, both for optimum pressure control and for suitable filter elements.

Pressure control

For hygienic reasons, the air between rooms in hospitals should flow in one direction only, from rooms with lower microbial counts to rooms with higher microbial counts.

Room ventilation systems with TROX components guarantee this direction of flow by using different designs for the supply and exhaust volume flows. Excess air flows through unavoidable room outlets into the adjacent areas, minimising hazards for patients and personnel.



City Hospital, Düsseldorf (D)



City Clinic, Krefeld (D)

TROX filters – for pure air

To prevent unnecessary health hazards to patients, some hospital areas require up to three levels of filtering.

TROX has an extensive product range, supplying not only filter casings but also filter media such as bag filters, fine dust filters and high efficiency particulate filters in the filter classes G3 - G4, F5 - F9 and H10 - U17.

Application areas for TROX filters include:

- ... Examination and treatment areas, particularly OP areas
- ... Intensive care
- ... Specialised and general medical care, care in the case of infectious diseases, premature births, maternity and infant wards
- ... Other areas including pharmacies, sterilisation etc.

New test certificates from the VTT testing institute:

All TROX filter inserts for the fine dust range were tested by the neutral, accredited VTT testing institute – the Technical Research Centre of Finland – in accordance with EN 779.



TROX products: filters

... Filter units for installation into

- ... ducts
- ... walls
- ... ceilings

... Filter media:

... HEPA and ULPA filters as high-quality air filters for separating out aerosols, toxic dust particles, microbes, etc., and for use in areas with the highest air purity requirements in clean room technology.

... These filters are available in the following forms:

- ... Panels
- ... Cells
- ... Inserts
- ... Filter elements



City Hospital, Düsseldorf (D)

The air solution for laboratories – TROX LABCONTROL SYSTEM

Room ventilation systems in laboratory buildings must fulfil complex requirements. The primary objectives must be to protect lab personnel against hazards and to consume as little power as possible.

With its LABCONTROL SYSTEM, TROX provides solutions custom-tailored to comply with every requirement. From the controlling and monitoring of individual laboratory fume hoods or rooms, to the equipping of complete ventilation systems for entire laboratory buildings.



BYK-Chemie, Wesel (D)

Complete ventilation concept

To put such a complete ventilation concept into effect – meeting the highest standards for both safety and comfort – it makes sense to work in close collaboration with the consultants, contractors, users and manufacturers of the lab technology, as early as the planning stage. TROX's same knowhow and complete product range also make the perfect refurbishment possible.

Your advantages:

- ... Competent advice and support during all phases of the project, from the planning to the hand over and also in the day-to-day operation
- ... Production service package: commissioning, system integration, maintenance and modernisation concepts
- ... Simple connection to superordinated systems through the use of standardised interfaces
- ... Greatest possible data transparency through the use of open systems such as LONWORKS® and BACnet
- ... Ventilation system solutions from one source, thereby reducing the number of interfaces required
- ... Reduction in fire loads due to significant reductions in wiring requirements for the bus technology used
- ... Supports flexible usage concepts: the systems can be easily modified to meet new demands
- ... Swift amortisation of investment costs due to lower operating costs
- ... Reduced power consumption due to optimised operation of the systems
- ... High level of operating safety due to self-monitoring of the systems
- ... Option of remote access to bus systems for diagnosis or modification purposes

TROX filters for more hygiene

Pharmaceutical products have to meet the highest standards. "Good manufacturing practice" (GMP) ensures that products are manufactured and tested in accordance with suitable quality standards.

Pharmaceutical, toxicological, clinical and galenic engineering issues are all crucial. But the specifications also stipulate the quality of the active and inactive ingredients used, the control methods and much more. Extensive documentation then enables the licensing authorities to evaluate the pharmaceutical product as part of the licensing procedure.



Clean room technology

Clean room conditions apply in the research and production of pharmaceutical products. TROX uses its know-how to ensure ideal conditions:

- ... Compliance with very high standards for air purity and sterility
- ... No air contamination of any kind can interfere with manufacturing procedures or contaminate products and thus result in high rejection rates
- ... Personnel must be protected against contamination

Pressure control – networked safety

A simple physical principle is used to prevent contaminations of pharmaceutical production areas: intentional positive pressure. This keeps unwanted air or particles from penetrating into the rooms.

TROX provides pneumatic and electrical systems to ensure effective positive pressure control. TROX is the only manufacturer to provide standardised solutions for connecting pneumatic room control systems to the LON world.

Central recording and visualisation of all system parameters, e.g. alarm messages, also increase safety. The wide range of modification options provides more flexible systems, while remote accessing enables diagnosis and adjustment without great investment in personnel and time.

TROX air conditioning and ventilation components ensure:

- ... Maintenance of a thermal room climate
- ... Removal of high heat burdens in rooms, e.g. from medical appliances or pharmaceutical production systems
- ... Reduction in levels of micro organisms and dust, anaesthetic or toxic gases, odours and other impurities in room air
- ... Maintenance of the air volume flow balance and pressure control for septic and aseptic OP areas, intensive care units or clean rooms

Our products also fulfil all the fundamental requirements for a perfect room climate:

- ... Comfortable air distribution and supply of fresh air into rooms
- ... Volume flow control
- ... Low noise levels
- ... Fire and smoke protection



Ventilation

Air distribution and the supply of fresh air into rooms – for more comfort

A comfortable room climate promotes people's efficiency and health. Optimum ventilation in buildings is thus an important prerequisite for ensuring that the people in them feel good. The proper supply of fresh air is therefore an important factor. TROX ventilation technology brings supply air into rooms so that

- ... it is distributed as evenly as possible
- ... there are no flow stagnation areas and temperature layers in the occupied zones
- ... no draughts occur in the occupied zones
- ... irritating flow noise is prevented

TROX has developed custom-tailored solutions specifically for use in hospitals, the pharmaceutical industry and laboratories:

- ... Filter-integrated, easy-to-clean air diffusers for OP areas, intensive care units or clean rooms in the pharmaceutical industry
- ... Easily cleaned air-water systems and air diffusers for corridors, sanitary areas and patients' rooms
- ... Decentralised ventilation systems for patients' rooms and offices
- ... Acid-resistant air diffusers for rapid replacement of large volumes of air, e.g. for laboratories

With their wide variety of designs and finishes, air diffusers and air-water systems can be installed into any ceiling, either freely suspended or mounted flush. Decentralised ventilation systems are integrated into the façade.

TROX products: ventilation

- ... Swirl diffusers and ceiling diffusers
- ... Slot diffusers and ball rail diffusers
- ... Combination diffusers
- ... Ventilation grilles
- ... Displacement flow diffusers
- ... Floor and staircase swirl diffusers
- ... Active and passive air-water systems
- ... Decentralised ventilation systems (window and façade ventilation units, wall units, underfloor units)



City Hospital, Düsseldorf (D)

Volume flow control and acoustics

Volume flow control – for an optimum room climate

A ventilation system's main job is to create pleasant and comfortable conditions in work rooms and occupied zones – as people's sense of well-being is the basic prerequisite for high efficiency.

In addition to supplying fresh air properly, systems must also maintain constant set temperature levels. To accomplish this, the air volume flows in the rooms must be supplied and extracted in a controlled manner.

The most important components for this are the volume flow control units. TROX offers a range of products that can be used in the widest variety of units in constant and/or variable systems. Certified products, such as explosionprotected components (ATEX), are available for systems with specialised requirements.

TROX products: volume flow control

- ... System-powered volume flow controllers
- ... Energy-powered control units

Low noise levels

The air flowing ventilation systems produces noise that can affect people's sense of well-being. In air distribution, the acoustics of the system elements are thus a key factor.

TROX undertakes research and development in its own acoustics laboratory. This is how attenuators are created, which can be adjusted individually to meet project-specific requirements. Their energy-saving splitters are constantly being optimised through ongoing development, resulting in considerably lower pressure loss at the same level of attenuation.

TROX products: acoustics

- ... Splitters for installation in rectangular ventilation ducts
- ... Circular attenuators



TROX Research and Development, Neukirchen-Vluyn (D)

Fire and smoke protection

Fire and smoke protection – with suitable systems from TROX

No matter what the structure, size or use of a building, if a fire occurs, early steps to control it are an important factor in any safety plan. This also applies for hospitals, laboratory buildings and the pharmaceutical industry. The earlier and more specifically a fire is detected, the greater the chances for safe evacuation and low levels of damage.

Built-in fire protection

That is why compartmentalisation is part of the built-in fire protection. For the critical transition areas between fire compartments, TROX manufactures shut-off units, such as fire dampers, which prevent the fire from spreading through the ventilation systems. To prevent smoke from spreading, smoke detectors are used for monitoring and control purposes.

Preventive fire protection

Nine out of ten times, fires undergo a relatively long initial smouldering phase in which they produce a great deal of smoke. Fire and smoke dampers from TROX prevent smoke from travelling through the ventilation systems, thus helping keep the emergency exits and escape routes safe.

Automated smoke extraction systems help keep emergency exits and escape routes smoke-free. Important components include smoke extraction dampers and communication systems.

TROX manufactures specialised components for systems with specialised requirements, e.g. explosion protection:

TROX products: fire and smoke protection

- ... Fire dampers
- ... Fire protection valves
- ... Smoke extraction dampers
- ... Smoke protection dampers
- ... Smoke detectors
- ... Communication systems

For systems with specialised requirements, such as explosion protection, TROX manufactures fire dampers with special verification of suitability.



Brandenburg Technical University, Cottbus (D)

