

► **Work safely** ►►

Flexible and energy-saving air management systems from a single source



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## ► The art of handling air ► ►

**TROX understands the art of handling air like no other company.**

Founded in 1951, TROX develops sophisticated components and systems for indoor air conditioning, as well as fire and smoke protection. Due to extensive research and development, TROX has, for years, been one of the sector's leaders in technology.

**TROX is an owner-run, globally active company.** With 25 subsidiary companies in 22 countries and 14 production sites in 12 countries, the company has efficient, customer-oriented manufacturing capacities that guarantee reliability and timely delivery, even in case of large-scale projects spanning several years.

**The company's competence in air management systems** is unique in the sector. For decades, TROX has been developing components and systems for areas that are highly sensitive in terms of ventilation. This means that TROX can offer its customers bespoke solutions from the control and monitoring of individual workstation areas to the complete supply of air handling systems for entire buildings.

## ► Innovation arises from experience ►►

**In sensitive areas** like hospitals, research institutes, or clean rooms, special requirements are placed on the air handling technology. In these applications precise compliance with the most demanding specifications are essential - whether occupational safety, environmental protection, or the highest quality standards in production.

**TROX has a wide experience** in dealing with these special and complex air management requirements. The company is a member of international committees for standardisation in these areas and, for many years, has been developing components and air management systems that combine modern occupational safety with efficient energy management.

**The extensive experience** that TROX has gained in demanding projects worldwide allows for continuous improvement to the air management systems (which have been extremely successful on the market). This means that TROX sets new standards in the sector again and again and exceeds the expectations of its customers: innovation is developed through experience.

TROX air management systems are used in all kinds of areas:

- Universities/colleges
- Research institutes
- Government facilities
- Hospitals
- Industry and technology
- Pharmaceuticals



*Max Planck Institute, Münster, Germany*



*System demonstration in TROX's own laboratory, Neukirchen-Vluyn, Germany*

► **Air management systems – a match for all requirements** ► ►

**More freedom for specialist consultants and building managers**

In the design of hospitals, research facilities, and clean rooms, flexible concepts over the life cycle of the building are playing an increasingly greater role due to financial reasons. In laboratories, for example, if changes and/or expansion become necessary at a later date, they can be implemented at minimum cost. The air management systems of TROX are already best prepared for this situation. They have a modular structure so that they can be expanded or adapted to changed conditions in a flexible and easy manner.

**Cost reduction by saving energy**

Since supply or extract air volumes are specified by national and international standards for occupational safety and environmental protection in sensitive areas, the air management plays a central role in saving energy. In this regard, TROX air management systems also set standards and guarantee a high energy efficiency due to an intelligent, demand based volume flow rate control. The operators can thus save considerable costs in the course of the building life.



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sanofi aventis, Frankfurt, Germany



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Applications: medicine, pharmaceutical industry, petrochemicals



**Areas of application for TROX air management systems**

- Research facilities, laboratories with fume cupboards
- Operating and sterile areas in hospitals and health facilities
- Clean rooms in pharmaceutical and semiconductor production
- Volume flow rate control in rooms with special requirements (offices, control rooms, meeting rooms)

Since 1998, TROX has been involved in standardisation according to DIN 12924, EN 14175 (laboratory control), and DIN 1946 TL 7 (room control).

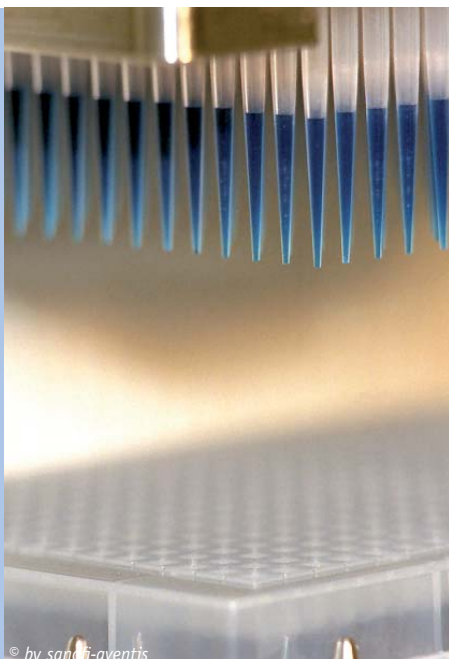
## ► Safe solutions for all applications ►►

**The application scenarios for safe air management systems** in sensitive areas like laboratories, operating theatres, sterile rooms, or GMP production areas of the pharmaceutical and semiconductor industries are becoming more and more complex and unique. In addition, air management systems are also being used to provide volume flow rate control, for example, in acoustically isolated control and meeting rooms.

**With EASYLAB and TCU-LON-II air management systems**, TROX has an effective solution for variable volume flow rate control for almost every application scenario. With these systems, various concepts for the control of room supply and extract air, fume cupboards, or room and duct pressures can be achieved. In addition, they can be linked with effective energy-saving and monitoring concepts, as well as individual room operating modes.

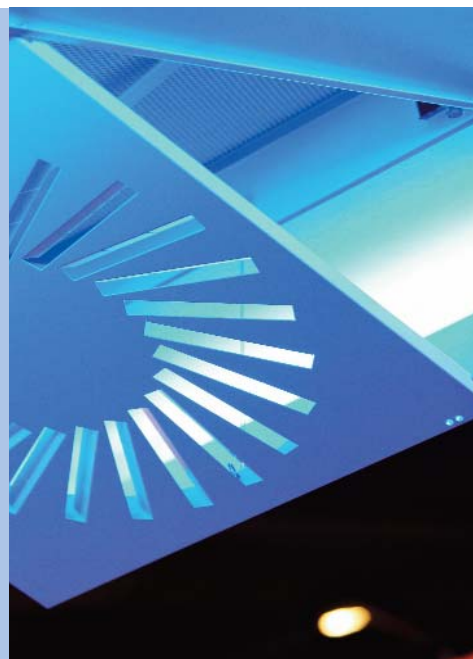
**Both systems guarantee rapid control response speeds** and highly efficient energy management. They have integrated monitoring functions and provide users with the greatest possible degree of flexibility.

**The electronic control components** of both systems can be combined with a large selection of air terminal units that meet all kinds of requirements due to different materials, sizes, and constructions.



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Screening in sanofi-aventis research laboratory



TROX swirl diffuser type VDW

### Advantages at a glance

- Rapid control response speed
- Integrated monitoring functions
- Maximum flexibility due to modular system structure and individual adaptability
- Plug-and-play communication line; alternatively standardised LonWorks® communication interface
- Operational cost savings due to efficient energy management

▶ LABCONTROL – the all round controller ▶▶



*Semper Opera House, Dresden, Germany*

**The audio and lighting control rooms** of the Semper Opera House in Dresden are equipped with automatic controllers of the TROX LABCONTROL type. Here, they ensure that when a window to the auditorium is opened for sound check purposes the negative pressure in the control room does not result in draughts in the auditorium.

**Without TROX-LABCONTROL**, the large doors for the plenary chambers in the Paul Löbe House would hardly be able to be opened. For sound insulation reasons, these doors are so air-tight that they require a special room pressure control technology.

**The capability of rapid response room control** is also used by the Finnish Food Safety Authority (Evira). In its laboratories, 250 TROX fume cupboard controllers are linked to 50 of the relevant room controllers (supply/extract air) and thus provide perfect working conditions as a complete solution.



*Paul Löbe House, Berlin, Germany*



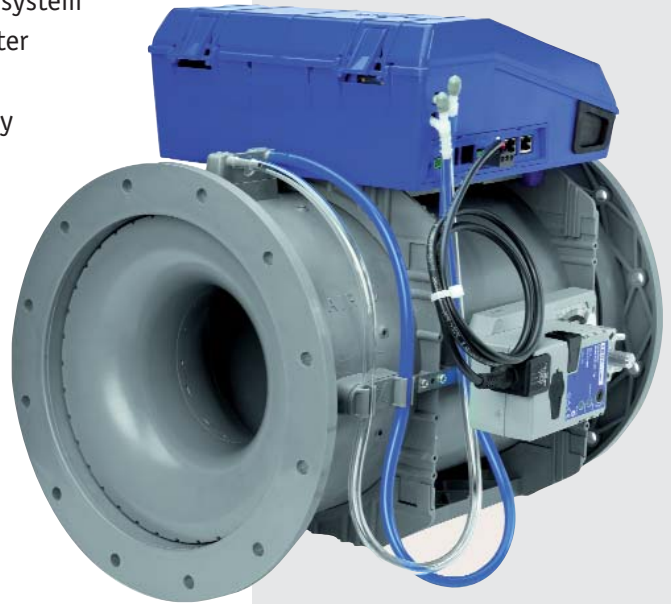
*Evira, Finnish Food Safety Authority, Helsinki, Finland*

## ► EASYLAB – plug-and-play safety ►►

**TROX EASYLAB is the air management system** for which all system subscribers can communicate with each other immediately after installation without the necessity of addressing. The modular structure offers project-related adaptability. The plug-and-play connecting possibilities combine easy installation with versatile expansion ability. Fume cupboard controllers can thus also be temporarily attached without the system having to be reconfigured or further commissioning being necessary. Just genuine plug-and-play!

**TROX EASYLAB consistently deals** with the demands for tenant-based, energy-efficient room solutions. Operating mode settings on three levels and display of current operating state and operating parameters - with EASYLAB, the tenant is always advised in detail on the current state of their room functions.

**The LonWorks® expansion** is a standardised interface for direct digital control to read system data or make superordinate settings.



### Ideal for smaller and medium-sized applications

- Plug-and-play communication system
- Modular controller hardware
- Versatile expansion ability
- System expansion with the automatic integration of new EASYLAB controllers
- Flexible operating mode scenarios and special functions
- Easy installation and commissioning

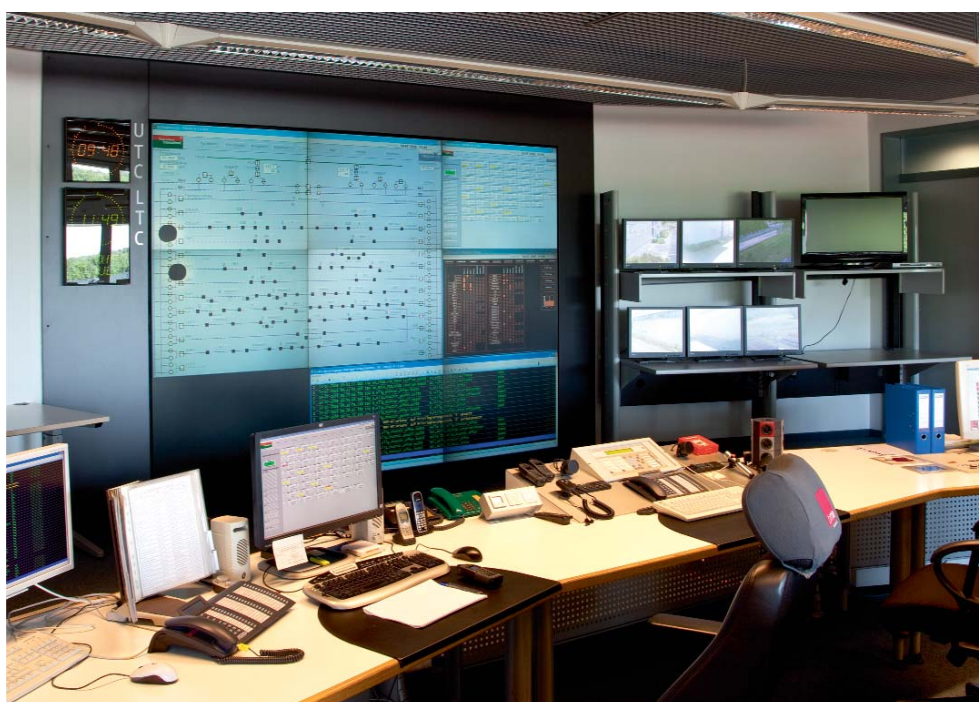
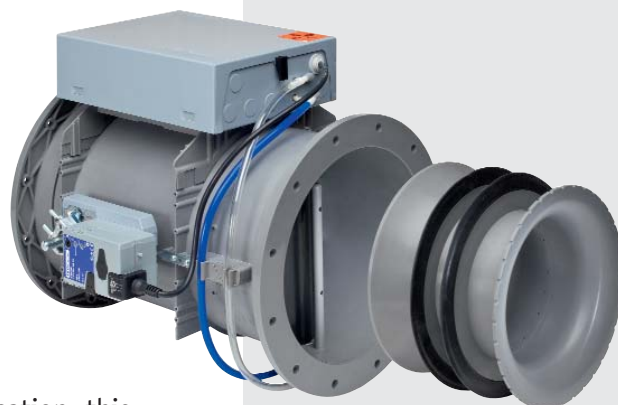
*Convenient monitoring and operation of fume cupboards, room balance or room pressure control with the BE-SEG-01 and BE-LCD-01 control units*

## ► TCU-LON-II – universally networkable ►►

**The standardised LonWorks® infrastructure** makes it possible to realise complex air handling control systems with minimum wiring costs. The interaction of all system subscribers is stored in an LNS database so that expansions or conversions can be implemented quickly. The TCU-LON-II controller consistently uses these advantages of the LON technology like no other subassembly for ventilation system solutions.

**Configuration can take place through the network.** For utilisation, this means that controllers can be set, modified, or tested worldwide by telephone or through the Internet. TCU-LON-II is thus especially recommended for hard-to-access areas, whether in hospitals, clean rooms, or laboratories. Due to its versatility, it is also used in offices where it can be controlled conveniently and elegantly using integrated touch panels and where the system data can be centrally visualised.

**In many air management areas, safety is very highly valued.** Here, monitoring devices can be used that emit local alarms using optical and acoustic signals in case of a malfunction and provide information about the malfunction through a parent centralised building management system. In these areas, TROX flow monitors (TFM) and TROX pressure monitors (TPM) check the safety.



*Easy integration into the centralised building management system*

### **Ideal for complex buildings with a LON infrastructure**

- LonWorks® communication system
- Centralised access for configuration and diagnosis through the network
- Optional worldwide remote access
- Network expansion to any size
- Easy integration of standardised LonWorks® components like touch panels



© by Dan Race

University Clinic, Aachen, Germany



Jägermeister, Wolfenbüttel, Germany

## ► Complete solutions from a single source ►►

As a globally active manufacturer of components and systems for the air conditioning of rooms, as well as fire and smoke protection, TROX – in addition to air management systems – offers a comprehensive range of quality air distribution products which enables performance and economically optimised bespoke product solutions from a single source. These are supplied in a timely and reliable manner.

### Chilled beams and swirl diffusers

With more than 50 different types, TROX offers unlimited variation options in the use of chilled beams and swirl diffusers. This also applies to special applications, such as low-turbulence air distribution in laboratories.

### Air filtration

TROX is a manufacturer of fine dust filters in filter classes F5 to F9 with performance certified by EUROVENT according to EN779. TROX also offers a range of filter units in various constructions with filter elements classes G3 to U16.

### Sound attenuation

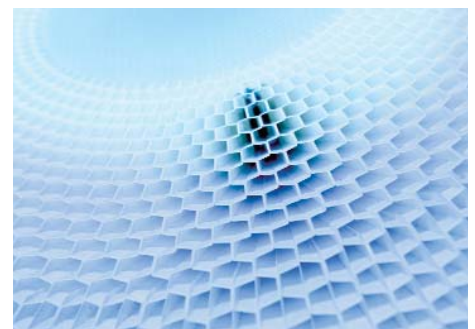
TROX produces high-quality splitters, splitter sound attenuators, and circular silencers made of various materials for all kinds of applications, for example, for use in laboratories.

### Fire and smoke protection

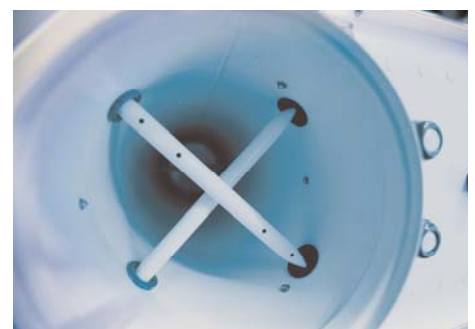
The extensive TROX product range for fire and smoke protection in buildings covers all kinds of applications with fire dampers fire resistance classes K30 through K180. For the control of fire protection systems, TROX relies on international standards like LON and AS-Interface.



Filter production



Air terminal device PROCONDIF®



Air terminal unit

## ► TROX reference buildings worldwide ►►

### Germany

- University Clinic, Aachen
- Charité, Berlin
- Merck, Darmstadt
- Semper Opera House, Dresden
- Bayer AG, Dormagen, Leverkusen
- BASF, Ludwigshafen
- BMW, Dingolfing, Munich
- Roche, Penzberg
- VW Research, Wolfsburg

### International

- AFSI Forensic Science Institute, Algiers, Algeria
- Campus 02, Graz, Austria
- Australian Nuclear Power Science and Technology Organisation (ANSTO), Lucas Heights, Australia
- Coca Cola, Brussels, Belgium
- 3M, Shanghai, China
- Henkel, Shanghai, China
- University of Shanghai, China
- University of Odense, Denmark
- ARK Therapeutics, Kuopio, Finland
- Dynamicum, Finnish Meteorological Institute and Finnish Institute of Marine Research, Helsinki, Finland
- Evira, Finnish Food Safety Authority, Helsinki, Finland
- Aventis, Lyon, France
- University of Marseille, France
- Biological E.LTD/MERCK&CO.INC, Hyderabad, India
- BIO Industry Park, Cavanese, Italy
- Eli Lilly, Florence, Italy
- University of Catania, Italy
- High School, Oslo, Norway
- Amphiagon Pharma, Spain
- BASF, Tarragona, Spain
- University of Sabanci, Istanbul, Turkey
- Cambridge Science Park, UK
- Moorfields Eye Hospital, London, UK
- Oxford University, UK



University of Cologne, Germany



Nestlé Suisse S.A., Vevey, Switzerland



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Dynamicum, Helsinki, Finland



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Oxford University, Great Britain



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# TROX<sup>®</sup> TECHNIK

The art of handling air

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