

The art of handling air



TROX[®] TECHNİK



The art of handling air

Good air is a factor in your quality of life. Whether outside in the open air or in an enclosed space, we only feel truly well in the fresh air. Air, the elixir of life, lets us breathe freely. It is invigorating, inspiring, and gives us the energy to live and work.

TROX understands the art of competently handling air like no other company in the world. In close collaboration with demanding clients from around the globe, we have successfully manufactured leading technologies and marketed systems and components for indoor climate control and ventilation. We are consistently expanding upon this position by means of intensive research and development activities.

The individual is the focus at TROX: as a client with visionary ideas and technological goals, as a motivated and qualified company employee, as a responsible decision-maker at the management level, and last but not least, as a human being who would like to live and work in well-ventilated spaces.

Since our corporation was founded, we have stood by this philosophy and vouched for our good name. It has created our distinctive client base and is indicative of our solution-minded approach, and is therefore the source of our company success.

In the following few pages we would like to introduce TROX as well as its extensive product range. Please, take us at our word by challenging us with ambitious tasks and by placing trust in our competency and client-orientated thinking. Share the experience: **The art of handling air!**



Heinz Trox



Head office Neukirchen-Vluyn (D)



Heinz Trox



The Individual is the Deciding Factor

The individual remains the deciding factor in all that TROX undertakes. The individual, by virtue of his or her visions, wishes, needs, abilities, and knowledge, defines the goals that TROX pursues carefully and deliberately.

TROX is an owner-led company with horizontal hierarchies in which the individual is decisive. Consistency, reliability, and a mature feeling of responsibility for clients, employees and the environment have been the pillars of the TROX GROUP company politics for decades.

It is the clients of TROX that decide how the company will act on their behalf. Clients set goals based upon their well-being as well as their architectural and technological visions, and TROX in turn assists them in realising those goals. The client-oriented corporate leadership has made TROX what it is today: a world-wide and effective partner for those demanding air conditioning and ventilation solutions for all types of buildings.

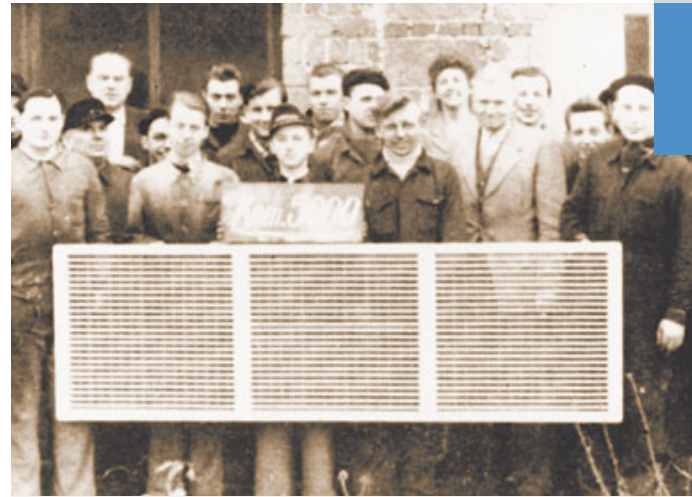
Each and every employee contributes to the success of the company in that they earn the clients' trust with their motivation and competence, and then they confirm that trust day after day. The targeted training and continued education of our employees as well as their lasting job satisfaction are thus important concerns of the management.

TROX History

- ...1951: The company was founded by Heinrich Trox
- ...1960: Klaus and Heinz Trox joined the company
- ...1962: The international extension of the company began with the establishment of a subsidiary in Great Britain
- ...1970: The first overseas subsidiary was founded in South Africa. TROX employs more than 1,000 workers
- ...1984: Turnover surpass 200 million DM
- ...1994 – 1999: The production subsidiaries in Malaysia and China were founded
- ...2001: Heinz Trox changed from the Board of Management to the Supervisory Board
- ...2005: Acquisition of the 21th subsidiary in Norway
- ...2006: Company name changed from Gebrüder Trox GmbH to TROX GmbH. Heinz Trox holds 90% of the shares, the Heinz Trox Foundation holds 10%

TROX in Figures

- ...2,700 employees worldwide
- ...270 million euros turnover in 2005
- ...21 subsidiaries in 19 countries
- ...12 production plants in 10 countries
- ...10 research and development centres worldwide
- ...More than 25 owned sales offices and more than 50 representatives and importers across the globe



Ventilation grilles, commission of 5,000, Neukirchen-Vluyn (D)



TROX subsidiary Auranor Norge AS, Brandbu (N)



Heinrich Trox, founder

In a small space of 110 square metres at his living quarters in Neukirchen-Vluyn, Heinrich Trox began the production of diffusers with his brother Friedrich in 1951. Within a few years, this “garage start-up” became a successful medium-sized company which is still family-owned today.



A Tradition of Innovation

The history of the company began with an innovation: the specialisation in components for ventilation technology. In the air conditioning industry, which was still quite young in 1951, this was a revolutionary decision. Trail-blazing inventions have since marked the rise of the company to the leading position in marketing and technology. Innovations themselves are tradition with TROX. The company holds over 200 patents and registered designs in air-conditioning and ventilation technology.

The systematic research and development of the individual product groups enjoys increasing expansion based on project-related development contracts. With its client-specific solutions, TROX sets a trail-blazing standard and with that in mind, continues to enter new and lucrative markets and maintain sustainable business opportunities. As a result, TROX, since the introduction of the first ceiling induction diffusers in the 80's, has been the leading supplier of these multifaceted products in Europe.



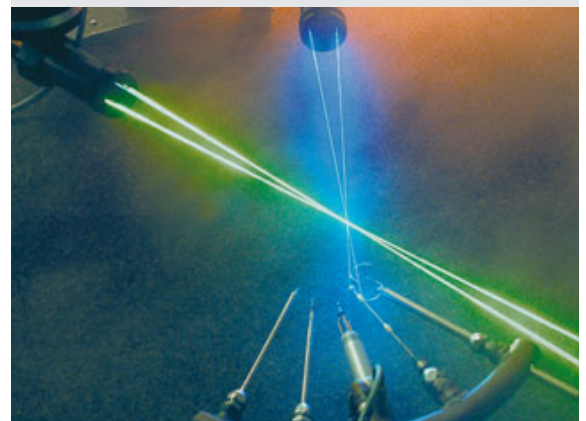
Energiekosten-Ermittlung

$$E_k = \frac{V \cdot \Delta p \cdot t}{\eta \cdot 1000 \cdot 3600} \cdot k_{st}$$
$$= \frac{m^3 \cdot N \cdot h}{s \cdot m^2 \cdot a} \cdot \frac{EUR \cdot s}{Nm \cdot h} \quad \text{in EUR/a}$$

in EUR
in m³/s

Selected Pioneering Feats

- 1968:** Development of the FD series swirl diffuser for mixed flow application
- 1969:** Registered design protection for the installation of grilles in ventilator shafts
- 1974:** Construction of the first fire damper with an official stamp of quality. Over 2 million units have been installed since
- 1975:** Development of the RN flow rate controller, with which TROX advanced to become the European market leader in the sector of "constant flow rate controllers"
- 1981:** The first diffuser with electronically-operated, temperature-sensitive air discharge control (VD, DG VAR)
- 1984:** The first ventilation grille with automatically-operated, temperature-sensitive air discharge control (DG SELF)
- 1988:** Construction of the first DID (active chilled beam). Today TROX leads Europe in the supply of these innovative chilled beams
- 1994:** Development of the first fire damper for cost-effective asbestos free construction
- 1995:** Invention of the multi service chilled beams (MSB)
- 2000:** Development of the decentralised ventilation systems for large projects for offices and administrative buildings



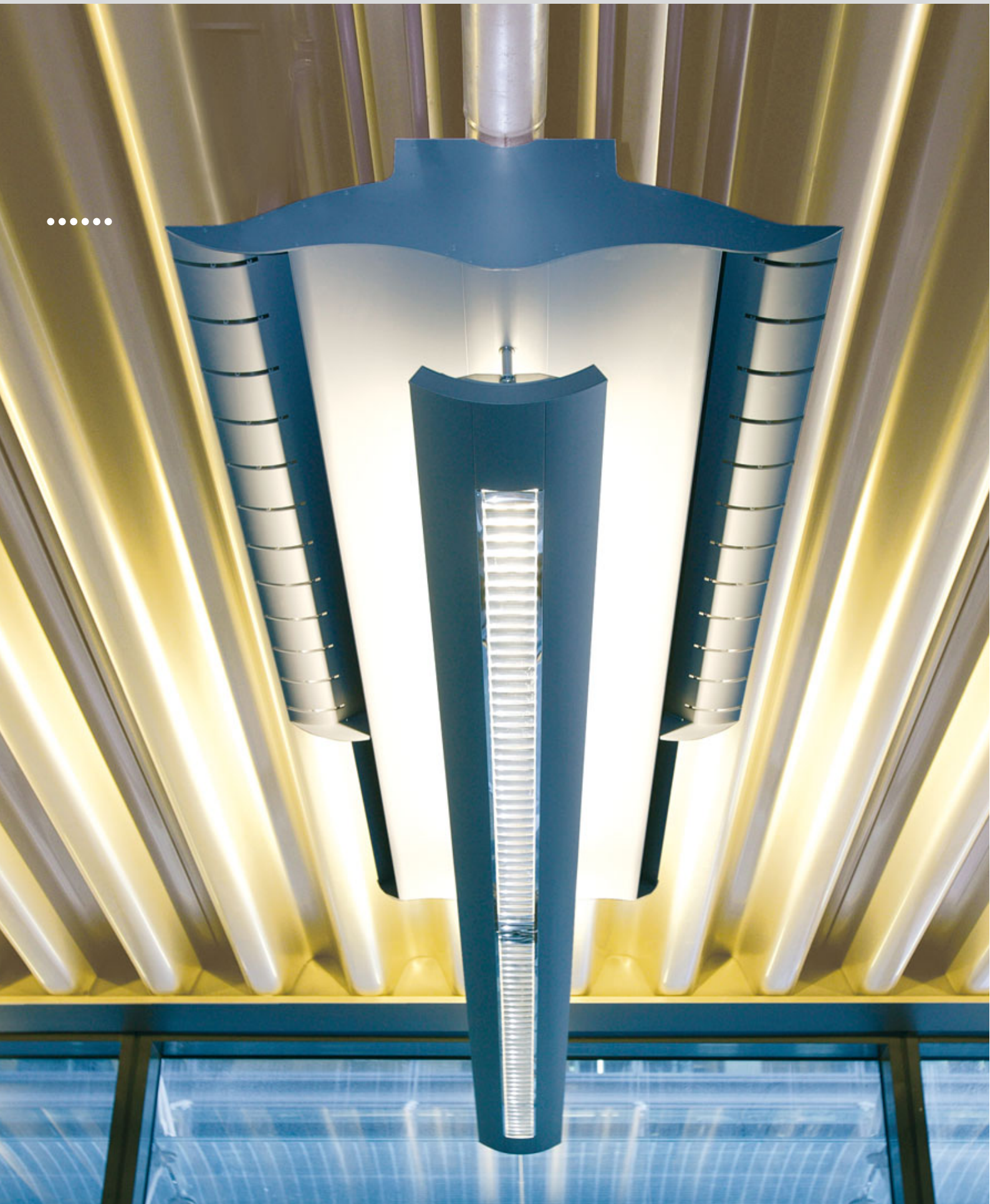
Measurement of air velocity for European research projects

Selected Prizes

- 1985:** Gold medal for DG self at Interclima in Paris (F)
- 1999:** Silver medal for outstanding design of the "Wavestream" at Interclima in Paris (F)
- 2002:** Gold medal for outstanding design of the "Passclean" at ExpoComfort in Milan (I)
- 2005:** "2005 Architecture and Technology" innovation prize for the ISH Aircontec from the "AIT" and "Intelligente Architektur" technical magazines as well as the Frankfurt/Main fair (D)



"Architecture and Technology" innovation prize



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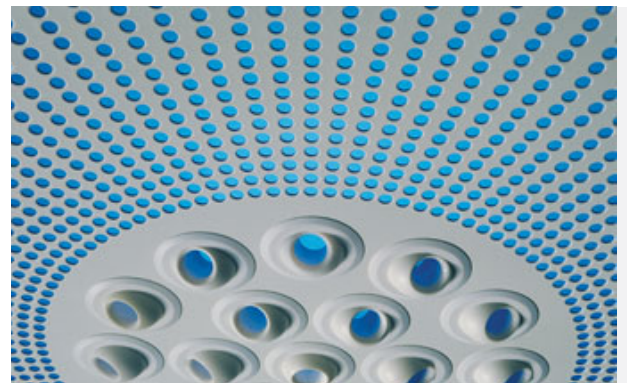
*Multifunctional ceiling MFD, installed in Chambre de Commerce
Luxemburg (L), designed by Claude Vasconi and Jean Petit*

More than the Sum of its Parts

TROX offers interchangeable parts and components for all areas of central and decentralised climate control and ventilation. The extensive product range extends from ventilation to fire control and flow rate control technology to filters. An ongoing optimisation of the products and production processes ensures lasting improvements to quality.

As well as the product diversity and the high number of standard product variations, the sales engineers at TROX will arrive at an optimum solution for their clients with an individual solution for every request. Whoever chooses to enlist the services of TROX will be getting more than just the sum of its parts because each component is designed for optimum compatibility.

You can feel the difference in comfort in a draft-free and noise-controlled atmosphere that never sacrifices its high air quality – **the result** is one which effectively increases a building's value and functionality.



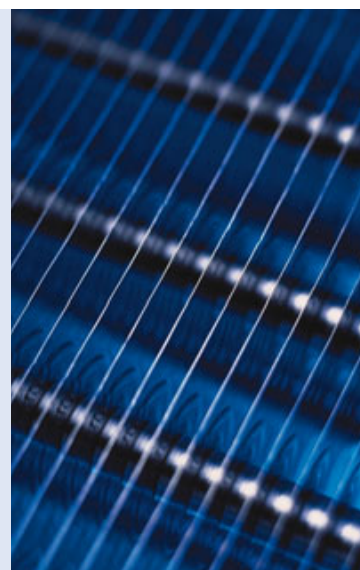
"passclean" design and ceiling diffuser for rooms with high occupancy



ARK steel non-return damper

The TROX Product Range

- ... Air diffusers
- ... Air-water systems
- ... Decentralised ventilation systems
- ... Fire and smoke protection
- ... Volume flow controllers
- ... Silencers
- ... Filters and filter units
- ... Communication and automation systems
- ... Ventilation solution for laboratories



Heat-exchanger in air-water systems



Exciting Solutions



In close collaboration with its clients, the “architecture + indoor climate” team develops individual climate control and ventilation solutions and supports architects and consultants with the development of optimum room ventilation concepts for new buildings and refurbishment projects. Whether it is a matter of ventilation systems for laboratories, the connection of fire dampers to control and communication systems, the development of design-oriented air-water systems, or decentralised ventilation solutions, the path that TROX takes with its clients has been proven time and again.

The earlier that the TROX engineers are integrated in the design process, the more resounding the success. “Architecture + indoor climate” offers planning security and cost control for complex buildings with detailed planning along the collaborative process shared with owners, architects, consultants and contractors.

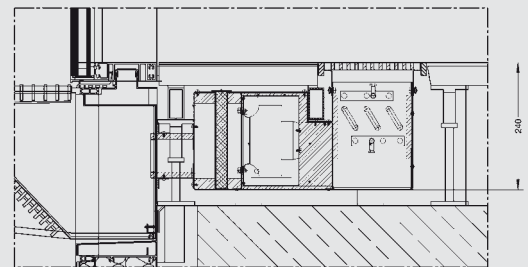
“architecture + indoor climate” the collaborative process

- ... Integration in architectural planning
- ... Concept development and optimisation
- ... Variant analysis
- ... Energy usage evaluations
- ... Economic efficiency analysis
- ... Design development
- ... Building of prototypes
- ... Performance tests (cooling, heating, acoustics, air distribution)
- ... Order execution

FSL decentralised ventilation, Post-Tower, Bonn (D)

Your advantages

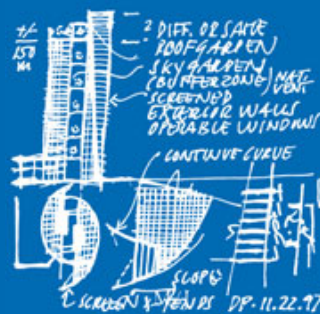
- ... Shorter construction periods
- ... Reduced ceiling void heights
- ... Easier installation (plug and play)
- ... Quicker amortisation of investments
- ... Clear reduction of interfaces
- ... Less maintenance and operating costs
- ... Energy savings
- ... More flexible refurbishment
- ... Intelligent control through the connection to building BMS
- ... Lower wiring costs
- ... Higher operational security
- ... Maximum flexibility of configuration and technology



FSL installation situation and layout – decentralised ventilation, Post-Tower, Bonn (D)



Post-Tower, Bonn (D)



Planning layout, architects Jahn/Murphy, Chicago (USA)



Clients Now, Partners Later

Client-oriented services are an integral part of the successful ventilation and climate control solutions at TROX. They decidedly improve the cost-effectiveness of any property during its life.

The clients will profit during all phases of the product life-cycle from the competency and solution-minded approach of the company's employees in the field, both for building development as well as for refurbishment and modernisation. TROX CUSTOMER SUPPORT guarantees quick reaction times and short travel distances during each phase of the programme with its extensive network of services.

An in-depth exchange of experiences is cultivated by TROX with its clients in the setting of TROX ACADEMY. TROX offers interested clients either the opportunity to learn about the latest research and development breakthroughs in air-conditioning and climate control in seminar format, or to further educate themselves more directly in workshops. As such, many satisfied clients become committed partners.



TROX® CUSTOMER SUPPORT

Supporting our customers during development, procurement and operation of an air conditioning system by:

- ... Individual consulting of new building construction and modernisation projects
- ... Product and program selection
- ... Measurement (function, acoustics, performance)
- ... Project design
- ... Online order tracking
- ... Troubleshooting
- ... Spare parts online-shop

TROX® ACADEMY

Seminars and symposia on the following topics:

- ... User-oriented ventilation concepts
- ... Fire dampers and smoke detectors
- ... Solutions for laboratory systems
- ... Maintenance and renovation of ventilation components



Canary Wharf, London (GB)

Did you know...

... that air is our most important element of life? A human being can live without food for over a month and without water for about a week, but without air a person can survive no more than three to five minutes at the most. And we need a lot of air to live! While we are quite adequately supplied with two litres of water per day, we breathe around 20,000 litres of air each day. In a poorly ventilated room, the air is quickly used up. The concentration of carbon dioxide mounts rapidly. The results are fatigue and decreased performance.



Shanghai (PRC)



Representation of federal state Bavaria at the EU, Uccle (B)



Mondrian Complex, EU administrative building, Brussels (B)



Teatro La Fenice, Venice (I)

At Home in Every Home

As an internationally active company, we have come into contact with the most pronounced climatic and cultural differences in various countries and regions across the world. Whether in South Africa, the USA, Brazil, China, or Northern Europe, TROX ensures a well-tempered atmosphere.

Each building is a world in and of itself. Airports, office buildings, hospitals, laboratories, and concert halls each have their own completely individual needs for climate control and ventilation technology.

And last but not least, each technical application, whether it is a chilled ceiling tunnel damper, a central air handling device or a multifunctional chilled beam, requires specific know-how.



Teatro di Roma, Rome (I)



A Strong Worldwide Team

The **TROX GROUP** is a strong team in the global world of climate control and ventilation technology, which also provides the best possible service for its clients. As a client, you'll find competent field workers and development engineers exactly where you expect them to be: right at your side.

TROX combines core concepts at various sites around the world. Independent centres of excellence that possess highly specialised know-how were formed by subsidiaries, research and development centres, and individual production plants.

Efficient information management makes results developed on-site available to the entire company so that a comprehensive reservoir of unrestricted company knowledge will be at the disposal of each and every client, regardless of their location.

The numerous factory sites of the TROX GROUP function independently according to strict quality guidelines. TROX can handle large tasks through the expert use of internationally distributed production capacities in short order and with a guaranteed level of quality.



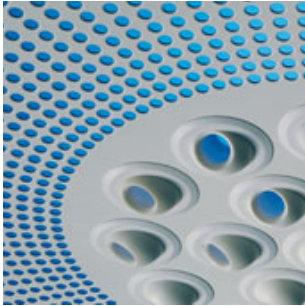
With perfect technical and creative implementation, TROX makes strides in development to achieve your architectural vision. Set a goal and TROX will find a way to reach it quickly and cost-effectively. Formulate your task description and TROX will find a solution that will excite both your clients and your business partners.



*Rembrandt Tower,
Breitner Centre,
Amsterdam (NL)*

Expertise for the world of building, in all shapes and sizes

- ... Office buildings
- ... Hotels
- ... Concert and theatre halls
- ... Shopping centres
- ... Recreation centres
- ... Hospitals
- ... Exhibition and congress halls
- ... Sports facilities
- ... Universities
- ... Airports
- ... Train stations
- ... Tunnels
- ... Ships
- ... Laboratories
- ... Clean rooms
- ... Data centres
- ... Automotive sites
- ... Oil production
- ... Food processing industry
- ... Power stations
- ... Chemical and pharmaceutical industry



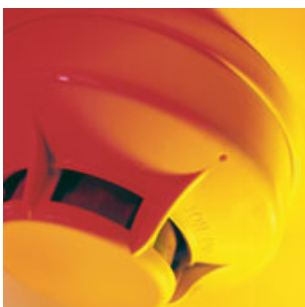
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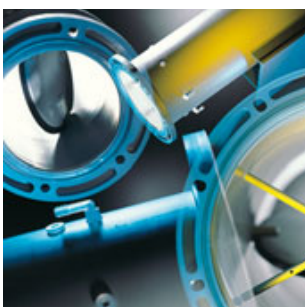
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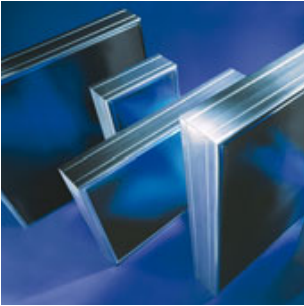
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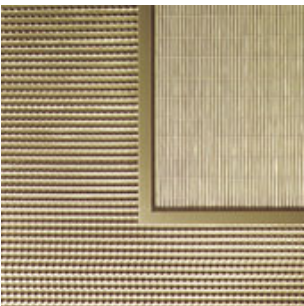


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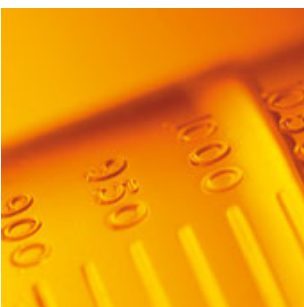
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For detailed information about our products and services, please visit our homepage (www.trox.de) or consult our technical leaflets.

Code	Design/construction	Volume flow (m ³ /h)	Size (mm)	Material
	○ Circular		L = Length	
	□ Square		W = Width	
	▭ Rectangular		H = Height	
			D = Depth	



Project: Estação Embratel Shopping and Convention Centre, Curitiba (BR)

Owner: Grupo K&G

Architect: Doria Lotes & Fiuza

Construction planning and management:
Syecla Eng e ICC Construtora

Mechanical services consultant:

AEB Engenharia,

L.C. Petry Serviços Engenharia

Contractor: Termoeste Engenharia

Ventilation solution:

Swirl diffusers (VD), displacement diffusers (ISH) and jet nozzles (DUE) as well as multileaf dampers and filters.



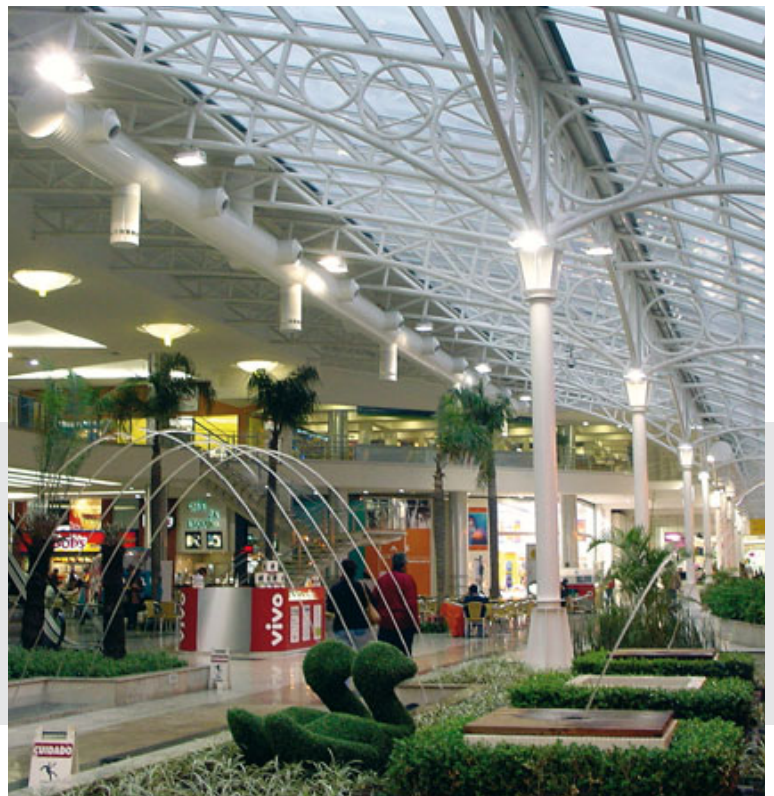
Comfortable savings

Displacement ventilation system for the Estação Embratel Shopping and Convention Centre in Curitiba (BR)

There were two main objectives for the renovation and expansion of a former train station in Curitiba into a three-storey shopping centre and the conversion of the upper floors into conference rooms: combining the greatest possible comfort level with absolutely minimal power consumption. That's why we decided to use a displacement ventilation system.

The firm AEB was commissioned to do the TGA design. They decided to use products from TROX because TROX was the only company in South America able to support the planning of a displacement ventilation system with the appropriate, extensive level of expertise.

"In this project we respected the original architecture of the station building, which presented real challenges when it came to ventilation and air conditioning," said Eugenio Beja, AEB's technical director. "But thanks to the great professional know-how at TROX and their really in-depth support we were able to realise our ideals in every area, from ventilation to air filtration, acoustics and fire protection."



Swirl diffusers

Swirl diffusers are an efficient solution for generating high induction between supply and room air. As a result they can be used with high air flow rates, making them suitable for both large and small rooms. With their wide variety of models and finishes, they can be integrated into any ceiling either suspended from or installed flush with the ceiling. Swirl diffusers are available with various finishes and in all RAL colours. An optional oxygen activator can be integrated upon request to improve room air quality.



"Wasserturm" restaurant in Cologne (D)



Series TDV, VDW

- This adjustable air diffuser enables flexible room design, for instance, in office buildings with lightweight partition walls and other system walls.

- ◻+ circular; square
- ↻ 60 – 1,300 m³/h
- ◀▶ ○ 300 – 625 mm
- ◻ 300 – 825 mm



Series FD, TDF

- Because this air diffuser can be used almost anywhere, it gives you the option of outfitting buildings with a single uniform design.
- These air diffusers, with their discreet design and fixed blades, are easy to clean.

- ◻+ circular; square
- ↻ 110 – 900 m³/h
- ◀▶ ○◻ 300 – 625 mm



Series FDE

- This fixed swirl diffuser with a rectangular outlet is popular thanks to its optimised acoustics and unique design.
- It is especially well suited for large rooms, such as sales areas.

- ◻+ square
- ↻ 400 – 1,400 m³/h
- ◀▶ ◻ 600/625 mm

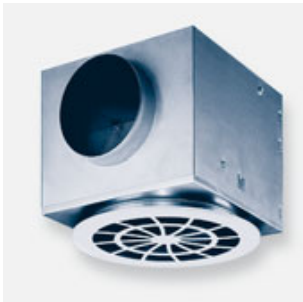
Swirl diffusers & ceiling diffusers



Series RFD, RA

- This compact swirl diffuser can be ideally integrated into any ceiling system, such as flush in plaster ceilings or over open grid ceilings.

- ▣+ circular; square
- ➡ 30 – 900 m³/h
- ◀▶ ○ □ 125 – 400 mm



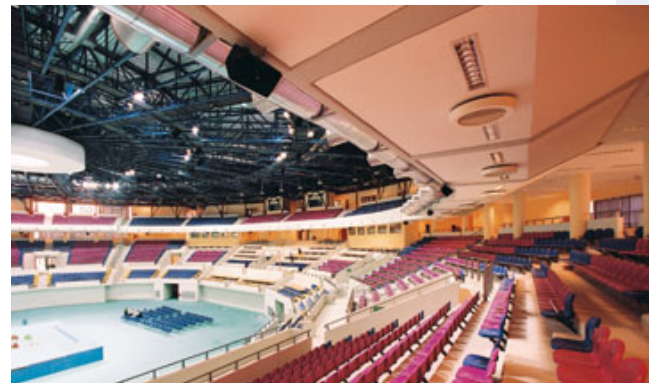
Series DCS, ADD, WD

- These products are available in individual customer designs or with a selection of attractive perforated plates.

- ▣+ circular; square
- ➡ 35 – 1,400 m³/h
- ◀▶ ○ 250 – 625 mm
- 250 – 600 mm

Ceiling diffusers

Ceiling diffusers are a comfortable way to generate mixed air flow quietly, even for large quantities of air. They give interior designers a great deal of design freedom since they are available not only in the usual range of shapes, but also in rectangular and linear construction, and they can be equipped with blades, a ball jet or perforation plate construction. Made of powder-coated sheet steel or aluminium.



Olympic weightlifting hall in Athens (GR)



Series DLQ, DLQL, DQ, ADLQ, ADQ, DDQF, LDD

- With the variety of sizes and shapes available, these types can be used in almost all building areas.

- ▣+ square; rectangular
- ➡ 110 – 2,000 m³/h
- ◀▶ □ 300 – 625 mm
- ▭ L: 400 – 2,000 mm
- H: 50 – 589 mm



Series ADLR, DDF

- The radial air discharge ensures a high degree of comfort.
- This ceiling diffuser is also available with a square face plate for integration into modular ceilings.

	circular; square
	70 – 1,800 m ³ /h
	○ 216 – 654 mm
	□ 600 – 625 mm



Series Pass, CF

- These two series were developed for public areas with a great deal of foot traffic.
- They save cleaning costs because their specialised air discharges prevent rapid soiling of the outlet and the ceiling.

	circular; square
	250 – 800 m ³ /h
	○ 500 mm
	□ 600/625 mm



Series LVS, Z-LVS

- These easy-to-install ventilation valves are a cost-effective solution for small rooms where you only need to circulate smaller quantities of air.

	circular
	20 – 300 m ³ /h
	○ 100 – 200 mm

Slot diffusers & linear ball diffusers

Slot diffusers and linear ball diffusers guarantee effective air distribution that can also be individually modified after installation. With their narrow faces they can easily be architecturally integrated into ceilings, even in rooms with low ceilings. Our continuous linear construction and mitred angle sections also enable ambitious visual effects to be achieved. The finishes are available in various RAL colours or in anodised aluminium. An optional oxygen activator can be integrated upon request to improve room air quality.



MARTA Museum, Herford (D)



Series VSD15, VSD35, VSD50, SC, SB

- These series are generally suitable for continuous assembly and can be inconspicuously installed parallel to linear light arrays.

- ▣+ rectangular;
1 to 4 slots
- ➡ 30 – 300 m³/h · m
- ◀▶ L: 600 – 1,950 mm



Series KS

- Our ball diffuser rail is a specialised design element. Adjust it radially or individually to fit your ceiling profile.

- ▣+ rectangular;
1 and 2 rows
- ➡ 30 – 130 m³/h · m
- ◀▶ L: 600 – 2,000 mm



Series Nozzle ducts

- The nozzle ducts have rotatable plastic nozzles and are good supply air elements for suspended ceiling installation.
- They bring fresh air into a room with low induction and thus without draughts.

- ▣+ circular
- ➡ 50 – 220 m³/h · m
- ◌ O 160 – 400 mm
L: 500 – 2,000 mm

Combination diffusers

Modern office buildings, which may for example have low energy requirements thanks to use of concrete core cooling, require small air exchange rates. On the other hand, they provide very little room for installing the ventilation. In such situations, installing combination diffusers into walls as a mixed flow or displacement air system is a compact and cost-efficient total solution.






Post Areal office building in Freiburg, Germany



Series VSD 35-3-AZ, QLW-AZ




- Air is supplied and extracted through a single element in the wall.
- The optional cross-talk sound attenuator effectively suppresses the transmission of sounds from room to room.

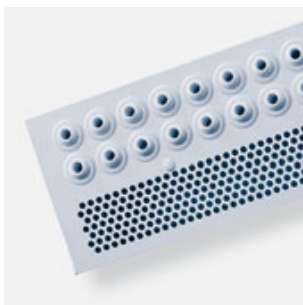
 rectangular; three-slot perforated plate
 40 – 140 m³/h
 L: 600 – 1,200 mm
H: 110 mm



Series VSD 50-1-LT




- This extraordinarily space-saving series with integrated cross-talk sound attenuator can be installed into light-weight partition walls.
- It is also available as a combined supply and extract air configuration.

 one-slot
 40 – 120 m³/h
 L: 600 – 1,200 mm
W: 75 mm



Series KUD2-ZLAL

- This supply and extract air combination with integrated cross-talk sound attenuator has ball jets for the supply air. Exhaust air is vented through a perforated plate in the bottom half of the outlet.
- The unique ball jets are arranged in two rows. Each jet can be adjusted in any direction thus making the supply air jet's penetration depth extremely variable.

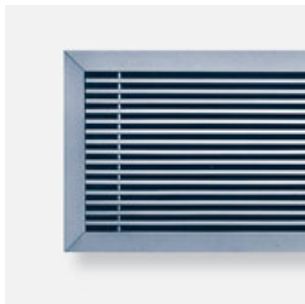
 double row of jet nozzles, perforated plate
 80 – 120 m³/h
 L: 600 – 1,200 mm
H: 200 mm

Grilles

Grilles, the classics among the air diffusers, can be used for supply and extract air. When used properly, they continue to enable low-cost and effective ventilation of rooms. Depending on the construction, they have the flexibility to be adjusted to suit specialised requirements and room partitioning. Linear grilles are a good design-oriented solution. They are made of anodised aluminium or steel and available in various RAL colours.



International Congress Center, Berlin (D)



Series AH, AF, EF, EFG, AWT, AGS, LG

- Equipped with fixed blades, these robust grilles are very stable and can be used in doors, floors, walls or ceilings.

- ▣+ rectangular; available with various border widths
- ↻ 60 – 7,000 m³/h
- ◀▶ L: 200 – 1,225 mm
H: 50 – 525 mm



Series ASL, AT, VAT, DGL, SL, TR, TRS, TRS-R, DG, DGR

- Grilles and linear grilles with adjustable face blades.
- For installation into walls, ducts and shafts.

- ▣+ rectangular; available with various border widths
- ↻ 60 – 7,000 m³/h
- ◀▶ L: 200 – 1,225 mm
H: 50 – 525 mm



Series DGVAR, DGSELF

- These grilles blow warm supply air downward and cold air upward. They regulate the direction of the air jet either automatically without an external power source or by means of an electric actuator.
- In industrial construction they can also be installed into circular ducts.

- ▣+ rectangular
- ↻ 50 – 1,900 m³/h
- ◀▶ L: 600 – 900 mm
H: 100 – 250 mm

Displacement flow diffusers

Displacement flow diffusers allow cooled fresh air to be distributed into rooms at very low air velocity and close to the floor so that a pool of fresh air forms over the floor. This prevents air turbulence and thus drafts. The air rises when it reaches sources of heat such as people or computers, transferring the heat and the used air to the ceiling. The fresh air quality in the areas occupied by people thus remains at the same especially high level while maintaining a pleasant set temperature. Displacement flow diffusers can also be integrated into wall areas or as columns in a room to save space. They are made of galvanised and powder-coated sheet steel and available in a variety of constructions.



"Lux Energy" office building in Luxembourg (L)



Series QLV

- This displacement flow diffuser's multi-cornered design is unique.
- It is available in a 90° model for corner installation, a 180° model for wall installation and a 360° model as a freestanding "column".

	90°/180°/360°
	70 – 4,100 m ³ /h
	○ 160 – 630 mm H: 500 – 1,750 mm



Series QLE and QLF

- These two types are notable for their flat, space-saving construction and feature an elegant face construction.

	rectangular
	40 – 3,700 m ³ /h
	L: 300 – 1,500 mm H: 150 – 2,000 mm



Series REPUS

- The many shapes and models of the REPUS type offer comfortable solutions with a wide variety of applications.
- They can be used flexibly for different purposes and in different locations.

Usage-specific dimensions and performance data

Floor and staircase swirl diffusers

Floor and staircase swirl diffusers installed in false floors and hollow flooring are an ideal solution for combining the advantages of mixed air flow with the advantages of displacement air flow. The latter can also be achieved using small diffusers. Use them anywhere you have demanding acoustic requirements: In assembly rooms, auditoriums and stage or screen theatres. They are made of aluminium, plastic or steel sheet metal, with a variety of finishes.



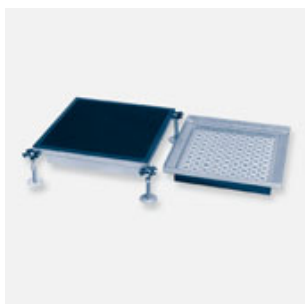
Centre National Sportif, Luxemburg (L)



Series FBA, FBK

- These floor diffusers have been designed to withstand very heavy usage.
- Can be used with and without a border unit.
- Control of discharge characteristics and unit flow rate are available as accessories which fit into the dirt trap.

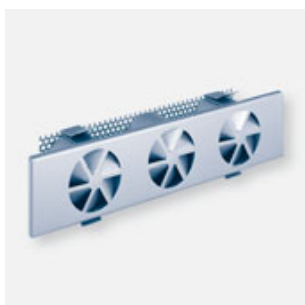
- + circular
 - 20 – 180 m³/h
 - ◀▶ ○ 150/200 mm



Series IAF, IRF

- This type was designed for false floors and provides all the advantages of displacement flow ventilation.

- + circular; square; rectangular
 - up to 330 m³/h
 - ◀▶ ○ 300 mm
 - ◻ 600 mm
 - ▭ 450 x 180 mm



Series SD, SDRF, LDD-ST

- This staircase swirl diffuser transfers small quantities of supply air into a room while quickly reducing their speed so that in theatres, for instance, each seat can be supplied with fresh air quietly and without draughts.
- They are installed vertically or horizontally in steps.

- + circular; rectangular; square
 - 20 – 80 m³/h
 - ◀▶ ○◻ 180 mm (SD)
 - ▭ L: 200 – 500 mm
 - H: 70 mm

Air diffusers for large rooms

Exhibition halls, airports, manufacturing spaces, lobbies, theatres and other large rooms require high performance ventilation capable of fulfilling the changing requirements of heating and cooling.

TROX air diffusers for large rooms control the air discharge direction of the air jet either manually or with an electric actuator, either discharging warm air downwards or distributing cold air horizontally throughout the room.

They are corrosion-resistant and robust. A variety of configurations are available for every ceiling type, whether suspended or flush. The diffusers are made of powder-coated aluminum or anodised sheet steel.






Radisson hotel "Blue Heaven" in Frankfurt (D)



Series VDR





- This adjustable ceiling diffuser discharges warm air downwards into the room when in heating mode.
- It is very quiet and an ideal solution for theatres, studios, multipurpose halls and other sound-sensitive areas.

 circular
 900 – 7,200 m³/h
 ○ 315 – 800 mm



Series VD, VDL




- These two adjustable swirl diffusers allow warm air to penetrate downwards into a room when running in heating mode and ensure optimum comfort in cooling mode.
- When fitted with a protection grid, they can also be installed in gymnasiums.

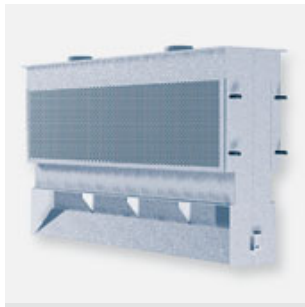
 circular; square
 250 – 7,000 m³/h
 ○ 315 – 800 mm
 □ 425 – 1,050 mm



Series ISH, QSH




- These displacement flow diffusers are primarily used in industrial manufacturing and installed as free hanging units.
- They can be adjusted individually for any temperature range.

 circular
 700 – 7,000 m³/h
 ○ 250 – 560 mm



Series IDH




- This active chilled beam was developed as an air-water system for spaces with high ceilings and can be installed at heights of up to 25 m. It is installed as a free hanging unit.
- The air discharge direction depends on the temperature.
- It has been designed for a maximum cooling output of 25 kW.

 rectangular
 300 – 3,200 m³/h
 L: 1,500 – 2,500 mm
 W: 305 – 548 mm
 H: 1,405 mm



Series PCD




- This PROCONDIF® ceiling diffuser supplies low-turbulence air from the ceiling and is suitable for laboratories and kitchens.
- It contains a highly permeable honeycomb structure and keeps the ceiling from getting dirty.

 circular; rectangular
 290 – 600 m³/h
 ○ 725 mm
 □ 600/625 mm



Series DUK, AJA

- These two compact jet nozzles are inconspicuous and are used to discharge air long distances to the occupied zone.
- They can be adjusted electrically or manually and work in heating or cooling modes.

 circular
 70 – 5,000 m³/h
 ○ 100 – 400 mm (DUK),
 ○ 200 – 350 mm (AJA)

Human beings are one of the biggest sources of humidity in internal spaces. We lose half a litre of water into the environment each day through our skin alone.

Too much humidity makes us feel unwell and minimises our ability to work. At room temperatures of 20 – 24°C, the body radiates about 20 – 35% of its excess heat by evaporating sweat on the skin's surface. As the temperature rises, our sweat production increases as well, and our cardiac and circulatory problems worsen. At relative humidity levels of 60 – 70 % and temperatures over 25°C, we feel that the air is sticky and oppressive, and our ability to work well falls to a minimum.





The optimum air conditioning solution, from every point of view

Distrito C de Telefónica, Madrid (E)

The new headquarters of the Spanish Telefónica Group in the Las Tablas district in the north of Madrid is a unique municipal office complex where over 14000 people work. The office complex consists of four towers and ten buildings joined by a glass roof, and freely accessible areas for restaurants, fitness studios, day care centres, a health centre, auditoriums, banks and other businesses.

In a detailed study, the consulting engineers tested all the conceivable air conditioning alternatives and used a comprehensive catalogue of criteria to evaluate the following: air quality, comfort, noise level, flexibility, space requirements, ecology, reduced power consumption, easy maintenance. Naturally the costs were a crucial factor.

“The quality of the product was tested in the research and development lab in Germany. We were invited to participate. A simulation of the specific project conditions was used to confirm the promised function of the active chilled beam (DID300B). The results were excellent, not only for the thermal performance but also for aspects such as stable air discharge, throw, temperature gradient and degree of turbulence.”

Eduardo Merayo, Project Development Consultant at UTE Úrculo-PGI

“Only a company like TROX was able to guarantee punctual and correct delivery for such a large project. TROX manufactured the products at two different locations, using an internal know-how and experience transfer program to ensure its high and consistent product quality-on-time.”

Miguel Angel García Alonso, Project Manager at Distrito C de Telefónica of Telefónica S.A.

Project: Distrito C de Telefónica, Madrid (E)

Owner: Telefónica S.A.

Architect: Rafael de la Hoz

Mechanical services consultant:

UTE Úrculo-PGI

Contractor: UTE Atil-Cobra, International

Tecair&Elecnor

Ventilation solution:

*More than 30,000 active chilled
beams Series DID300B*



COMBEAM®: Air-water systems that can do it all

Air-water systems use water coils to cool and/or heat air locally in a room. Hot air rises, is chilled by the water coils and falls back into the room. The system saves energy because it takes less power to transport heat away in water than in air. Air-water systems can be installed in open or suspended ceilings and are very well suited for refurbishment projects. We differentiate between active and passive chilled beams.

COMBEAM®, or multi-service beams, the multifunctional air-water systems from TROX, not only provide the normal heating, cooling and ventilation functions, but can also be equipped with extra mechanical services, enabling space-saving integration of lighting, smoke alarms, loudspeakers and sprinkler systems. COMBEAMs can also be designed in the form of design elements to accentuate a building's architecture, for example, as ceiling sails or as inconspicuous ceiling installations. And of course the option of smooth integration into centralised building communication and control systems goes without saying.

Advantages for installation and refurbishment

- Shortened installation time thanks to integral prefabrication
- Easiest possible assembly (plug and play)
- Significant reduction in interfaces
- Reduction in ceiling void height
- Reduced investment costs
- Faster amortisation of investments

Advantages in operation

- Energy savings
- Low maintenance and operating costs
- Flexibility for changes of use



Empress State Building, London, (UK)



PIR sensor



Smoke sensor



Sprinkler

Active air-water systems

Active air-water systems contain water cooling coils and also bring fresh air into rooms from the central plant. To achieve comfort conditions for the occupants of the space, only one third of the required air supply from an all air system is necessary to supply the required fresh air to the space.

Because the system is based on the principle of induction, no extra fans are necessary to transport the air, thus saving energy and reducing noise to an absolute minimum. Active air-water systems are mostly called active chilled beams.

These systems save space because they allow you to reduce the size of the central plant systems and supply ducts, and their installation height is very low. They are operationally reliable and low-maintenance because they do not contain any moving parts. They run in both cooling and heating mode, which means you do not need to install extra static heaters.



Caritas Bank, Brussels (B)



Series DID300, DID300B, DID600B, DID600B-L

- These active chilled beams are available with optional integrated lighting and extract air systems.
- Their supply air discharge is comparable to that of the slot diffuser.
- Active chilled beams can be installed parallel or at 90 degrees to the facade.
- The DID300 can also be operated under wet coil conditions.

	rectangular
	10 – 220 m ³ /h of primary air
	L: 900 – 3,000 mm W: 300/600 mm H: 210 – 240 mm Cooling capacity: 150 – 1,620 W



Series DID-R

- Series DID-R active chilled diffusers are especially well suited for upgrading pre-existing tee bar ceilings and for integration into plaster ceilings.
- Their supply air discharge and ceiling installation is comparable to that of the classic ceiling diffusers.
- The DID-R can also be operated under wet conditions.

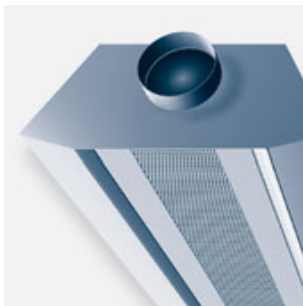
	circular; square
	40 – 80 m ³ /h of primary air
	○ 600 mm □ 600/625 mm H: 250 mm Cooling capacity: up to 500 W



Series DID-E

- Series DID-E active chilled beams are installed into a formed plaster board bulkhead.
- Wide variety of options for configuration the air inlet and discharge openings.
- Especially well suited for hotel bedrooms and individual offices.

➡ 20 – 150 m³/h
 of primary air
◀▶ L: 700 mm
 W: 900/1.200/1,500 mm
 H: 200 mm
 Cooling capacity: 1,500 W



Series AKV

- This attractive active chilled beam unit can be used with or without a false ceiling.

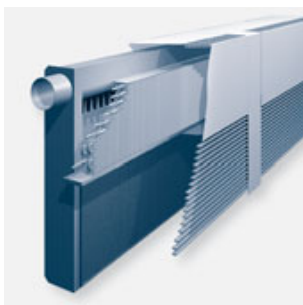
⏏ rectangular
➡ 40 – 300 m³/h
 of primary air
◀▶ L: 900 – 3,000 mm
 W: 300/500 mm
 H: 200 mm
 Cooling capacity: 1,600 W



Series QLS

- This skirting board displacement flow diffuser combines the advantages of displacement ventilation with the energy savings of air-water systems.
- It can completely replace the need for a static heating system.

⏏ rectangular
➡ 75 m²/h · m
◀▶ L: 1,000 – 2,000 mm
 H: 150 mm
 D: 150 mm
 Heating capacity: 500 W/m



Series QLI

- This induction type displacement flow diffuser is installed under sills.
- It is a simple retrofitting solution for buildings containing high pressure induction units from the 1970's.

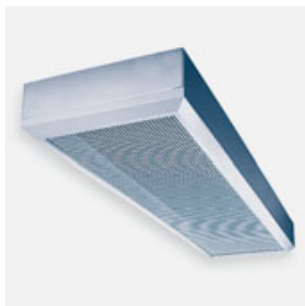
⏏ rectangular
➡ 45 – 125 m³/h
◀▶ L: 900/1,200/1,500 mm
 H: 730 mm
 D: 200 mm
 Cooling capacity:
 350 – 920 W

Passive air-water systems

Neither ventilation systems nor fans are required to operate passive air-water systems. Hot air rises, is cooled by the water cooling coils and falls back into the room. We recommend a combination with air systems for optimum air conditioning and ventilation. Controlled air humidity ensures condensate-free operation with optimum and noise free cooling.





"Burda" publishing house, Offenburg (D)



Series PKV

- Series PKV chilled beams have a large cooling performance range.
- They give interior designers a great deal of freedom in designing rooms.
- Can be an optimum supplement to existing systems for dealing with high heat loads.

 rectangular
 L: 900 – 3.000 mm
 H: 110 – 300 mm
 W: 180 – 600 mm
 Cooling capacity:
 60 – 1,500 W



Series WK-D-WF, WK-D-EL

- High performance convective chilled ceilings for hanging as a plank style ceiling.
- Beautifully shaped design in various finishes.


Cooling capacity acc. to EN 14240 (8K):
 WK-D-WF: 128 W/m²
 WK-D-EL: 120 W/m²



Series WK-D-UL, WK-D-UM

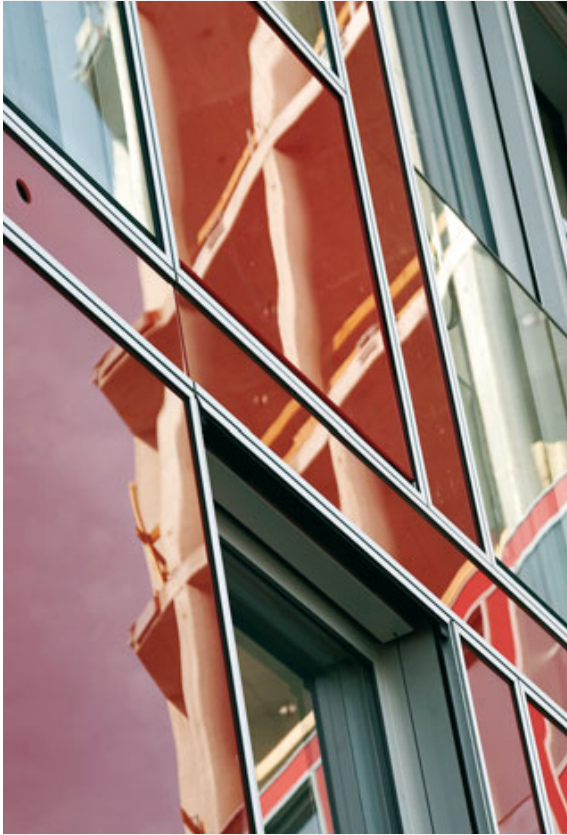
- These chilled ceiling systems provide a high degree of comfort thanks to their radiant cooling area.
- They can be used as lay-in elements in metal ceiling tiles or incorporated into a plaster ceiling.

Cooling capacity acc. to EN 14240 (8K):
 WK-D-UL: 48 – 80 W/m²
 WK-D-UM: 48 – 76 W/m²



When the air is too dry, it can make you ill. In winter, heating frequently makes the air much too dry. Sore throats, sinus infections and susceptibility to colds are the result. About one-third of all sick days are taken due to illnesses affecting the respiratory passages. Good room air quality, ensuring optimum good health, not only keeps employees fit but pays off for employers as well.

Decentralised ventilation systems



New design freedom in building interiors thanks to an active exterior façade

Capricorn Building in the Düsseldorf Media Harbour, Düsseldorf (D)

The Capricorn Building in the Düsseldorf Media Harbour is a low-energy building with extremely low operating costs. The building's entire media supply (electrical engineering, lighting, communications, air conditioning and ventilation) were realised with the aid of 800 active façade modules. The decentralised ventilation units from TROX, which have less than 20 cm depth, were inserted into the façade modules and connected to the services with quick release couplings.

The decentralised supply allows the consultant to eliminate bulky, complex duct networks and enormous centralised plant rooms in the building's core. This created a wealth of new opportunities for the building's interior design. Which is why the GATERMANN + SCHOSSIG architectural firm described the solution from TROX as "paving the way for the office building of the future because they give consultants the greatest degree of freedom for a building's interior design."

Another key point was the product design which met the highest standards for maintenance, service and minimised downtime. The air filters, which were designed in the form of inserts, are quick and easy to replace after opening the access panel. The installed functional unit can be unplugged from all its supply media in a few simple steps and can then be easily lifted out of the façade.

In 2005, the architectural firm GATERMANN + SCHOSSIG and TROX shared the "2005 Architecture and Technology" innovation prize for these extraordinarily flat façade ventilation units.

Project: Capricorn Building, Düsseldorf (D)

Owner: Capricorn Development GmbH

Architect: GATERMANN + SCHOSSIG

Consultant for mechanical services:

HUBER Ingenieur-Technik GmbH,

WINTER Beratende Ingenieure für

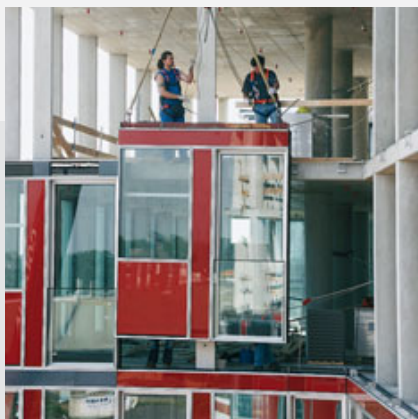
Energie- und Gebäudetechnik GmbH

Contractor: M+W Zander Gebäudetechnik GmbH

Ventilation solution:

Decentralised ventilation units from TROX

integrated into an active exterior façade



"We were able to build on the vast experience at TROX to meet the demands for office air conditioning in the Capricorn building, using a wealth of individually developed technologies integrated into the decentralised ventilation units."

GATERMANN + SCHOSSIG

More individuality and flexibility, with minimised investment and energy costs

In our decentralised-façade-system ventilation (FSL), we integrated sound-absorbing ventilation units into a building's exterior. These units can be installed under sills, in walls or false floors. They transport fresh air into rooms and/or exhaust air out along the shortest possible route.

Both in construction and in retrofitting, decentralised, individually controllable ventilation systems from TROX offer a rich variety of design options for ventilating a building. Clients can install a complete decentralised ventilation system or combine the decentralised supply air system with a central extract air system. The product variation ranges from simple flow devices to complex systems with heating and cooling functions and integrated individual room regulation (FSL-CONTROL). An optional oxygen activator can be integrated upon request to improve room air quality.

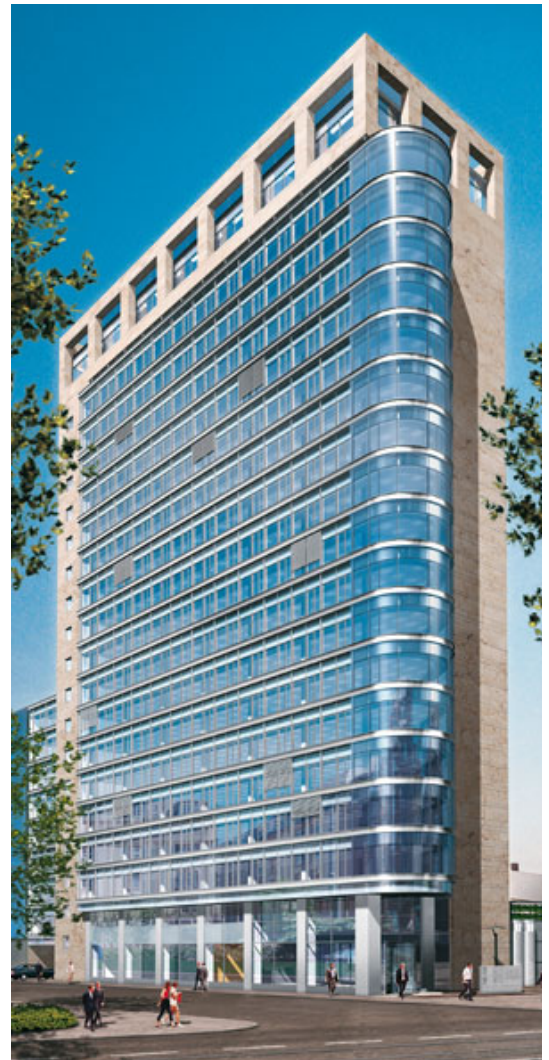
Decentralised ventilation systems provide numerous advantages. Individual users can adjust the air quality and room temperature in their rooms according to their own individual tastes. For investors, TROX systems are economical, energy-saving and, above all, flexible solutions that can be re-adapted at any time with very little work to suit change of use.

In developing decentralised ventilation units, TROX takes its inspiration from the inventiveness and design resourcefulness of architects to find solutions in which functionality and design merge into an ideal whole.

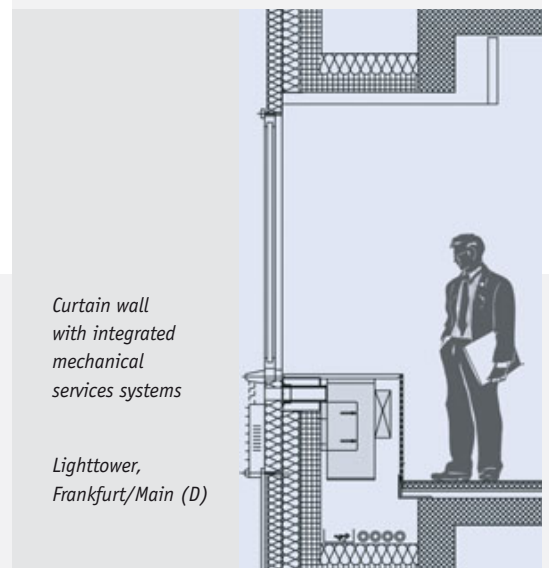
With our cost-efficient prefabrication of façade elements, TROX provides investors with integral construction, reduced installation times and reduced interfaces.

Advantages:

- Individual heating, cooling and ventilation
- Air filtration
- Attenuation
- Heat recovery
- Night cooling with the windows closed
- Reduced construction costs thanks to small slab to slab heights
- Flexible equipment and upgrades
- Low operating costs



Lighttower, Frankfurt/Main (D)



Curtain wall with integrated mechanical services systems

Lighttower, Frankfurt/Main (D)

Sill units

Sill units are decentralised ventilation units integrated underneath windows. They are available as supply air or as supply and exhaust air units.



Series FSL-B-60

- This sill unit can be easily installed above or below a window or in façade profiles, as it can be installed either vertically or horizontally.
- It is especially well suited for hall and office areas.
- It contains a manually operated air control blade and an attenuating element that allows a natural transfer flow of small quantities of air while preserving good attenuation properties.

- ➔ 10 – 50 m³/h
Unit standard sound level difference up to 47 dB
- ◀▶ H: 60 mm;
variable depth and width



Series FSL-B-100

- This façade ventilator for office, hotel and residential applications has very high sound absorption levels and enables modular, user-oriented implementation.
- The natural ventilation flow can be augmented with a mechanical fan.
- Configurable as a supply or exhaust air unit.

- ➔ 30 – 80 m³/h
Unit standard sound level difference up to 57 dB
- ◀▶ H: 100 mm;
variable depth and width



Series FSL-B-190

- Integration of supply and exhaust air functions in the smallest possible volume, including electric fans and heat recovery.
- There are a number of equipment options, allowing it to be used in a multitude of ways e.g. in schools, seminar rooms, hospital ward blocks and hotels.
- Optionally available with a heat exchanger for heating and cooling modes and with a thermal switch for static heating.

- ➔ 60 – 120 m³/h
Extra heating and cooling capacities from 200 W to 1.6 kW available
- ◀▶ H: 190 mm;
variable width

Wall units

Wall units are attached to the exterior wall of a building and are frequently used in apartment construction, often as retrofitting solutions as well.



Series FSL-W-ZUL

- These easy-to-install and easy-to-upgrade wall ventilation units are very attractive in design.
- They can replace window ventilation in noisy environments.
- In apartment construction, they are well suited for ventilating individual rooms and can also be used in bedrooms.

➔ 20 – 160 m³/h

Under floor units

Under floor units were developed in particular for buildings with floor-to-ceiling glass façades. The units, which are integrated into false floors, are available as supply air systems only or in supply/exhaust air combinations which mix recirculated air.



Series FSL-U-ZAB

- As a comfort conditioning supply and exhaust air unit with integrated heat recovery, this is a high quality replacement for a central ventilation plant.
- Static heating is possible when the ventilation is switched off.

➔ 60 – 120 m³/h
 ◀▶ Unit height: 203 mm
 Grille width: 500 mm



Series FSL-U-ZUM

- A narrow, attractive linear grille discharges conditioned supply air into the room for heating or cooling.
- This unit works extremely quietly.
- Energy consumption is optimised by limiting the outdoor air volume which is mixed with recirculated air, with high heating and cooling performance standards.

➔ 60 – 200 m³/h
 ◀▶ Unit setup height: 180 mm
 Grille width: 230 mm



Groundbreaking fire and smoke protection concept for maximum safety

Terminals B and C in Düsseldorf Airport, Düsseldorf (D)

The tragic fire catastrophe at the Düsseldorf Airport in 1996, in which 17 people lost their lives and many more people were injured, showed that when fires break out it is not high temperatures but the spreading of toxic gases that presents the greatest danger for life and limb.

That's why, when rebuilding the destroyed Terminal B and building the new Terminal C, airport operators placed special emphasis on early detection of fires and on keeping smoke out of the emergency exits and escape routes.

To keep smoke and gases from spreading through the ventilation systems, the TROX fire dampers were equipped with a spring return actuator and a thermoelectric release mechanism. Because the thermal release mechanisms do not close the fire dampers until temperatures rise over 72° C, most of the fire dampers have also been equipped with additional smoke detectors. If smoke develops, the smoke detector will shut the fire dampers and prevent the smoke from spreading, even at temperatures below 72° C.

Smoke detectors can set off false alarms when dirty, with vast consequences. That's why TROX smoke detectors come with the option of checking the degree of dirt contamination, allowing them to undergo maintenance procedures in good time. They also contain a flow sensor that automatically closes the related fire dampers if not enough air is flowing through the detector chamber, meaning that the smoke detector's sensor sensitivity is no longer guaranteed. This together with additional monitoring systems means that an optimum level of safety has been achieved in Terminals B and C.

Project: Airport 2000 plus
Owner: Airport Düsseldorf GmbH (D)
Architect: J.S.K. Dipl. Ing. Architekten
General firms: Hochtief AG, Bilfinger Berger AG, Philip Holzmann AG
Contractor: Arge Imtech
Mechanical services consultant: Ingenieurgesellschaft Kruck GmbH
Fire protection solution: Fire dampers with spring return actuators, thermoelectric release mechanisms and smoke detectors



All the functions of the fire dampers and smoke detectors have been integrated into a modern building automation system by LON technology. Thanks to the innovative networking of the fire protection systems into the airport's primary systems (e.g. heating, air conditioning, cooling), the latter will be automatically switched off in case of fire.

Fire and smoke protection

The law requires a comprehensive range of fire and fit-for-purpose testing for fire and smoke protection components. Their use and applicability according to German State building regulations has been granted by national technical approvals from the German Institute for Structural Engineering (Deutsches Institut für Bautechnik) in Berlin.

TROX is the market leader for fire and smoke protection in new building and refurbishment projects, which is why experienced maintenance companies know the TROX products. TROX provides companies with the expert knowledge

necessary for servicing and maintenance in certified training sessions. Furthermore TROX offers a telephone support line to assist in selecting and installing the right products.

TROX makes it comfortable for everyone involved. All TROX approvals have been listed on a well-organised CD – from the approval for the first fire damper in 1974 to the approvals for today's products.

The TROX fire protection systems are completed by an extensive replacement part service. From fusible links to ancillary items to refurbishment of dampers, TROX has the widest range of replacement parts available on the market.

Fire dampers and fire protection valves

Fire dampers have to close after a certain temperature is reached, sealing off sections of a building to prevent the spreading of fire and smoke.

To prevent smoke from spreading at temperatures below the temperature that triggers the thermal release, fire dampers can also be closed by optional smoke detectors. Fire dampers require approval.

TROX provides the right fire damper for every installation situation.



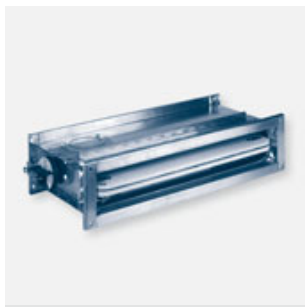
DaimlerChrysler, Sindelfingen (D)



Series FKRS-02-K90, FKR-01/02-K90



- Our circular fire dampers are installed both in solid walls and ceilings and in lightweight partition walls.
- They are available with small and large diameters.
- The smaller model has the national technical approval Z-41.3-604.
- The large model has the national technical approval Z-41.3-322.

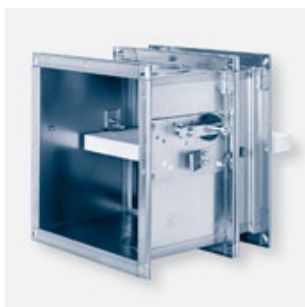
- ◻ circular
- ◀▶ Series FKRS-02-K90
 - 100 – 200 mm
- Series FKR-01/02-K90
 - 100 – 710 mm
- Fire resistance class depending on usage



Series EN-FKS-K90



- This small angular fire damper was also designed for integration into both solid walls and ceilings and lightweight partition walls.
- This model has the national technical approval Z-41.3-653.

 angular
 W: 200 – 800 mm
 H: 100 – 200 mm
 Fire resistance class:
 K 90 acc. to DIN 4102



Series FK-K90, FKN-K90, W-FK-K90, W-FKN-K90



- These large angular fire dampers can be installed not only in solid walls and ceilings and lightweight partition walls, but also on the outside of walls and ceilings.
- These models have the national technical approvals Z-41.3-321, Z-41.3-318, Z-41.3-580 and Z-41.3-581.

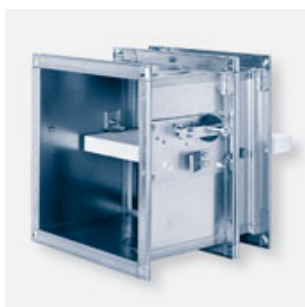
 angular
 W: 200 – 1,500 mm
 H: 200 – 800 mm
 Fire resistance class:
 Depends on usage



Series KU-K30



- This plenum box with integrated fire damper has been approved for installation into fire-resistant false ceilings.
- This model has the national technical approval Z-41.3-320.

 square
 □ 300 – 625 mm
 Fire resistance class:
 K30-U according to construction and testing principles



Series E01-K90



- This large angular fire damper is suitable for installation as a refurbishment damper in solid walls and ceilings.
- This model has the national technical approval Z-41.3-323.

 angular
 W: Approx. 300 – 1,500 mm
 H: Approx. 300 – 800 mm
 Fire resistance class:
 K 90 acc. to DIN 4102



Series FV-K90, FVZ-K30



- These fire protection valves can be installed in solid walls and ceilings, lightweight partition walls and fire-resistant false ceilings (F30).
- These models have the national technical approvals Z-41.3-317 and Z-41.3-319.

 circular
 ○ 100 – 200 mm
 Fire resistance class:
 Depends on usage
 or K30U



Series FVS-K90

- This fire protection valve is for installation into ventilation systems in accordance with DIN 18 017-3.
- This model has the national technical approval Z-41.3-324.

 circular
 ○ 100 – 200 mm
 Fire resistance class:
 K30, K60 or K90 acc.
 to DIN 18017



Smoke dampers

Smoke dampers are an important part of automated smoke extraction systems built e.g. to keep vital escape routes smoke-free if a fire breaks out. Smoke extract dampers are all equipped with electric actuators and must remain functional during fires for at least 30 minutes.



Series EK-01



- This smoke damper is suitable for installation into solid walls and ceilings, lightweight partition walls and on the face of walls.
- This model has the national technical approval Z-78.2-13.

 angular
 W: 200 – 1,500 mm
 H: 200 – 800 mm
 Fire resistance class:
 EK30, EK60, EK90
 depending on usage



Series EK-02

- This dual-function smoke damper was designed for smoke extraction systems with additional ventilation functions. Usage and available sizes match those of series EK-01.
- The required functionalities were realised using a TROXNETCOM® solution.
- This model has the national technical approval Z-78.3-101.

 angular
 W: 200 – 1,500 mm
 H: 200 – 800 mm
 Fire resistance class:
 EK90




Smoke protection dampers

Smoke protection dampers are used to prevent smoke from spreading in central ventilation plants with full fresh air systems to systems which have the supply air mixed with recirculated air, and in the case of older systems to make them smoke safe. They are not suitable for taking over the function of fire dampers.



Series JZ-RS

- Smoke protection dampers are basically equipped with spring return actuators.
- This model has the national technical approval Z-78.4-51.

 angular
 W: 400 – 2,000 mm
 H: 345 – 1,995 mm

Smoke detectors

Smoke detectors are used to monitor ventilation duct systems in air conditioning systems.



Series RM-0/2

- Permissible air velocity in this ventilation duct is 1 to 20 meters per second.
- This smoke detector must undergo monthly maintenance.
- This model has the national technical approval Z-78.6-88.



Series RM-0-VS-D

- This smoke detector has a wide range of functions for self-monitoring (dirt contamination, air flow, electronics) and only requires maintenance on an annual basis.
- It is optionally available as a BUS enabled version.
- Permissible air velocity in the ventilation duct is 1 to 20 meters per second.
- This model has the national technical approval Z-78.6-67.

More than 80% of the deaths that occur in fires are due to smoke poisoning. In the toxic smoke, people lose consciousness after only two to three breaths.

Our lungs cannot withstand much, especially in conjunction with high temperatures. They start to become damaged at 65°C.

In nine out of ten cases, fires undergo a relatively long initial smouldering phase in which they produce a great deal of smoke but relatively little heat. For example, 10 kg of foam will produce a volume of smoke and fire gases of 25,000 cubic meters. Intact, well-coordinated fire safety systems and modern building communication and control systems will detect fires early, prevent smoke from spreading within the building and exhaust the smoke gas.





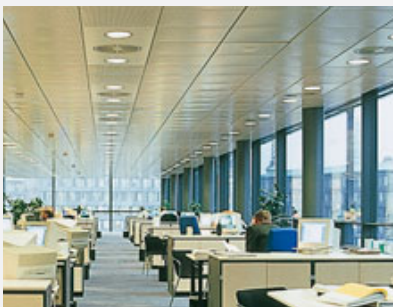
Project: HQ Nordea Bank (DK)
Owner: Nordea Bank A/S, Copenhagen
Architect: Henning Larsens Tegnestue A/S, Copenhagen

Mechanical services consultant:
Carl Bro A/S, Glostrup

Contractor: Glenco Bro A/S, Hvidovre

Ventilation solution:

Motor actuated VarySet VAV ceiling air diffusers (FD swirl diffuser) with face plate designed by Henning Larsen and series TVR VAV controllers used as duct pressure controllers.



Over 7.5 million cubic meters of air moved

Volume flow control at Domizil Christiansbro in Copenhagen (DK)

The new district of Christiansbro is located on the harbour waterfront near the Copenhagen Courthouse and market square. There, the 35,000 square-meter Domizil Christiansbro serves as the headquarters for Nordea Bank A/S.

19 plant rooms move a total of 320,000 cubic meters of air every hour in the building in a rectangular and circular ducting network totalling 15 km in length. That means we are moving over 7.5 million cubic meters of air every day. TROX series TVR VAV controllers make sure we are distributing the conditioned air properly, working as duct pressure controllers and motor driven VarySet VAV-ceiling diffusers.

Danish architect Henning Larsen designed the face plate of the air diffuser. It is an FD series swirl diffuser with integrated motor actuated VarySet function that ensures constant levels of optimum induction conditions for the volume flow required.

Duct pressure is maintained at constant levels by the Series TVR VAV controllers. This will prevent excessive pressure in the system. Specified noise levels are consistently complied with.

Project Head Jan Birch of Glenco A/S is enthusiastic, not only about the technical solutions but also especially about the partnership-like cooperation with TROX.

“In all the phases of construction, TROX Danmark A/S delivered the ventilation components on deadline, which meant that installation could be done in the briefest possible time period. Our cooperation with TROX was smooth and professional. The builder’s commissioning and final inspection of the systems, and subsequent service, were carried out to the satisfaction of everyone involved.”



System-powered flow rate controllers

This type of controller eliminates conventional throttle dampers, thus eliminating the time-consuming and expensive work of balancing and adjusting the volume flows in the building.

With Series R and E controllers, the desired volume flow rate can be simply adjusted manually using the scale located on the outside of the unit. These volume flow controllers were designed for constant volume flows but are also available with motorised set volume adjustment.

The casing and the control damper are made of galvanised sheet steel. These controllers are generally maintenance-free.

The plastic Series VFL volume flow rate limiter is easy to insert into circular ducts. It limits the volume flow to the set value and maintains the flow rate at a constant level within a narrow tolerance band when changes in pressure occur.



Ruhrhaus Laboratory, Essen (D)



Series R

- This volume flow rate controller for circular ducts can, for instance, be used adjacent to diffusers.
- This classic controller was developed back in 1975 and, after being updated in the 1990's, remains the market leader in the area of constant volume flow rate controllers.

- ▣+ circular
- ◀▶ ○ 80 – 400 mm
- ➡ 40 – 5,040 m³/h
- Δp: 50 – 1,000 Pa



Series E

- This volume flow rate controller was designed for rectangular air ducts and large volume flows.

- ▣+ rectangular; square
- ◀▶ W: 200 – 600 mm
- H: 100 – 600 mm
- ➡ 144 – 11,800 m³/h
- Δp: 50 – 1,000 Pa



Series VFL

- The VFL is a plastic volume flow limiter.
- It helps balance and adjust volume flows, e.g. in ductwork adjacent to diffusers.
- Its main application area is in the ventilation of residential flats.
- In addition to their more typical application in commercial buildings, volume flow limiters can also be used in residential areas.

- ▣+ circular
- ◀▶ ○ 80 – 250 mm
- ➡ 15 – 205 m³/h
- Δp: 30 – 300 Pa

VARYCONTROL®:

Energy-powered flow rate controllers

With these flow rate controllers, you can individually adjust a room's temperature and/or air quality by means of the supply air volume flow. The system only supplies the amount of air required, which saves energy. VARYCONTROL® units can also be used as duct or room pressure controllers. They include electronic or pneumatic control components.



Hamburg Airport, Hamburg (D)



Series Easy

- VAV controller with electronic TROX compact controllers for easy handling.
- The easy selection of the units, by nominal diameter only, and the easy adjustment of the volume flows at the construction site will save you money during design, installation and commissioning.
- Test the function directly at the controller by means of a green check light.
- Series TVR, TVJ, TVT, TVZ and TVA Easy are available.

Features by unit type



Series TVR, TVRK

- These flow rate controllers are used in circular ducts.
- They are good for moderate acoustic requirements.
- For more stringent requirements, you can use sound attenuators and acoustic cladding.

- ☐+ circular
 - ↻ 36 – 6,048 m³/h
 - ◀▶ ○ 100 – 400 mm
- Airtight acc. to DIN EN 1751, Class 4 or 3*



Series TVZ, TVA

- These VAV terminal boxes with integrated sound attenuators can be used where low noise level requirements exist.

- ☐+ circular; rectangular
 - ↻ 54 – 6,048 m³/h
 - ◀▶ ○◻ 125 – 400 mm
- Airtight acc. to DIN EN 1751, Class 4 or 3*
Casing leakage air flow acc. to Class A, DIN EN 1751



Series TVM

- The series TVM dual duct terminal box regulates room temperature by mixing warm and cold air.
- The TVM unit was designed for comfort conditioning VAV systems and also meets stringent acoustic standards thanks to its integral sound attenuator.

□+ circular; rectangular
↻ 162 – 6,048 m³/h
◀▶ ○ □ 125 – 400 mm

*Airtight acc. to DIN EN 1751, Class 4 or 3
Housing leakage air flow acc. to Class A, DIN EN 1751*



Series TVRC

- The series TVRC was specially developed for comfort conditioning of ship cabins or hotel bedrooms using variable flow rate control.
- The TVRC is used in conjunction with either an optional room control panel and integrated temperature sensors or with a central communication and control system.
- The integral electric reheat eliminates the need for any other heating systems in the room.
- A LONMARK[®]-compatible variant is available (Siemens version).

□+ circular
↻ 72 – 1,152 m³/h
◀▶ ○ 125 – 200 mm

Housing leakage air flow acc. to Class B, DIN EN 1751



VAV EasySet

- The TROX VAV EasySet is a set of control components for retrofitting volume flow control units.
- One typical application is to replace velocity sensors. The old control dampers can be recycled, saving money for the retrofitting project.

For systems with circular ducting.
↻ 35 – 6,035 m³/h
◀▶ For ○ 100 – 400 mm

Shut-off devices

Shut-off dampers are for ventilation systems in which areas have to be isolated for certain operating situations.

Multileaf dampers are used to isolate and restrict the air-flow in ductwork and other openings.

Weather resistant louvres provide good protection to keep rain, leaves and birds from getting into the air inlet and exhaust openings of ventilation systems.

Pressure relief dampers and non-return dampers are used to isolate individual sections in ventilation systems.



When the fan is running, the blades open. The degree of opening depends on the air velocity through the unit. When the fan is switched off, the blades close automatically.

Combinations of weather resistant louvres and multileaf dampers or pressure relief dampers have a dual function in air inlets and exhaust openings of ventilation systems. They keep rain, leaves and birds from getting in, but also provide the option of restricting or isolating the airflow during ventilation system downtime.



Series AK, AKK, TDK

- These circular dampers have many applications.
- Available with manual adjustment or with motorised control.
- Damper blades are made of galvanised steel or of plastic.



 circular
 80 – 400 mm

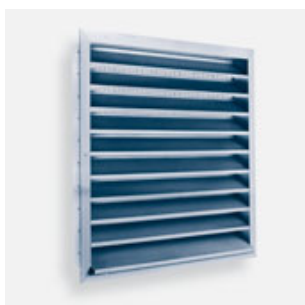
Airtight acc. to DIN EN 1751, Class 4 or 3



Series JZ, JNE, JZ-L, JZD-G



- Multileaf dampers are available in a variety of constructions, up to a leak-tightness level acc. to DIN 1946 or DIN EN 1751.
- Made of steel, stainless steel or aluminium.

 angular
 W: 200 – 2,000 mm
 H: 100 – 1,998 mm



Series WG, WGE, AWG, AWK, WG-F




- Weather resistant louvres are available in single or multi-section units and suitable for façade installation.
- Made of steel, stainless steel or aluminium.

 angular
 W: Between 97 and 2,400 mm
 H: Between 97 and 2,310 mm



Series UL, KUL




- Pressure relief dampers are used to shut off supply and exhaust openings in ventilation systems.
- Made of steel or aluminium.

 angular
 W: 300 – 1,600 mm
 H: 215 – 1,615 mm



Series WG-JZ, AWG-JZ, WG-KUL, AWG-KUL




- Various combinations of weather resistant louvres and multileaf dampers or pressure relief dampers.

 angular
 W: 400 – 2,000 mm
 H: 345 – 1,995 mm



Series ARK




- This non-return damper is used to isolate individual sections of ventilation systems.
- The maximum pressure across the closed damper blades is 5000 Pa.

 angular
 W: 200 - 1,200 mm
 H: 345 – 1,995 mm



Series ARK2




- This pressure relief damper is used where a risk of over pressure exists.
- Its opening pressure difference is set at the factory.
- For dampers ≤ 600 mm in width, the opening pressure difference is 50 – 1,000 Pa. For dampers > 600 mm, the maximum is 600 Pa.

 angular
 W: 200 – 1,200 mm
 H: 345 – 1,995 mm



Series NAK

- This shut-off damper is for ventilation systems in which areas have to be isolated with a high degree of integrity (gastight) for safety reasons under certain operating situations.
- The maximum pressure across the closed damper blades is 5,000 Pa.
- The maximum permissible leakage acc. to KTA 3601 or DIN 25414 is $0.01 \text{ m}^3/\text{h} \cdot \text{m}^2$ at a pressure difference of 2,000 Pa.

 angular
 W: 400 – 1,000 mm
 H: 270 – 1,000 mm



Project: Athens Concert Hall, Megaron, Athens (GR)

Owner: Friends of Music Society and the "Tourism-Culture" programme

Architect: Meletitiki – A.N. Tobazis Ltd.

Mechanical services consultant:
Team M.H. Ltd.

Acoustical consultant:

Dr. Gottfried Schubert

Contractor: TERNA S.A.; AKTOR S.A.; J&P AVAX S.A.

Ventilation solution:

Series MSA sound attenuators, ventilation grilles, various air diffusers such as the VSD slot diffuser with and without acoustic lining, linear ball diffusers, swirl diffusers, ceiling diffusers series ADLQ, DLQ and ADLR, series DUK jet nozzles and displacement flow diffusers.



Pianissimo would still be far too loud

Acoustically neutral ventilation solution for the Megaron in Athens (GR)

The Megaron (Athens Concert Hall) is a building complex that was opened in 1991 and expanded in 2004–05. It serves as a multicultural centre and includes several concert and conference halls, as well as an exhibition centre, foyers, restaurants, practice rooms, an underground parking garage and the "Atrium of the Muses", a central open-air events area.

Renowned acoustic consultant Dr. Gottfried Schubert created a planning concept for the air-conditioning and ventilation systems for the entire building complex, particularly for the concert and theatre halls.

"A ventilation system that is very quiet is still much too loud for a concert hall. Pianissimo is not enough in these cases. Ventilation solutions for such demanding areas must be acoustically neutral. In specific terms, that means: They cannot have any disrupting influence on the room's acoustics and the audience's listening experience. When it comes to the system solutions from TROX, this is guaranteed," said Dr. Gottfried Schubert, who has been working with the acoustic selection programmes from TROX for years.

"The technical system descriptions and selection programmes from TROX simplify my work as an acoustic consultant enormously," said Dr. Schubert, "because you can rely on the accuracy of that information one hundred percent. Built as planned – TROX keeps its promises."

The Megaron enjoys an excellent reputation in the professional music world because of its outstanding acoustics.




Silencers


In ventilation systems, noise stems from a variety of components such as the fans or the fire dampers. To comply with a specified noise level, sound attenuators are added to suitable locations in the ventilation system. The sound attenuators should have adequate silencing capabilities, low air resistance and be as small as possible. With the introduction of VDI 6022, specific hygiene requirements for room air conditioning systems were required for the first time. Splitters and splitter attenuators from TROX are certified for use in room air conditioning systems in accordance with VDI 6022 Parts 1 and 3, DIN 1946 Parts 2 and 4 and VDI 3802.



Series MKA, XKA

- The aerodynamically formed splitter frames reduce pressure drop by up to 30% with respect to the old style splitters, this also reduces the system operating costs.
- As an alternative, construction can be in 1.4301 stainless steel, aluminium or coated splitters.
- Series MKA provides a higher level of attenuation, particularly in the area of critical fan noise levels.
- Series XKA is well suited for silencing higher frequencies (e.g. in cases of machine noise).

 rectangular; square
Size: 100, 200, 300 mm


 L: 500 – 1,500 mm
H: 300 – 1,800 mm


Other dimensions available upon request



Series MSA, XSA

- Sound attenuators consist of rectangular casings with built-in splitters of series MKA/XKA.
- The casing connection flanges are made up from air duct profiles with a 30-mm width. As an alternative, an angle flange (35 x 3 mm) is also available. The angle flange must be used when there is a split on W or H dimensions.


 rectangular; square
Maximum one piece sizes available:


 W: 200 – 2,400 mm,
L: 500 – 1,500 mm,
H: 300 – 1,800 mm



Series CA, CB, CF, CS, CAK

- Series CA and CB are made of galvanised sheet steel. The absorption material is mineral wool covered with a glass fibre scrim and a perforated plate. Series CA is a good secondary silencer for volume flow rate controllers. Series CB is suitable for more stringent acoustic requirements.
- Series CF and CS are made of aluminium. Series CF, a flexible construction, is well suited for installation, situations where there is complex ductwork and/or limited space. Series CS consists of rigid aluminium and is used, for instance, as a secondary silencer for TVR Easy.
- Series CAK is made of plastic (PPs) and is well suited for installation into circular ductwork carrying aggressive media.

 circular

 Ø 80 – 1,000 mm
L: 500 – 2,000 mm
Insulation thickness:
CA/CB = 50 or 100 mm
CF/CS = 25 or 50 mm



Project: Inkosi Albert Luthuli Central Hospital, Durban (ZA)

Owner: KZN Department of Health

Architect: FGG Architects (Ken Howie)

Mechanical services consultant:

*Delen & Oudkerk Consulting Engineers
(Ben Oudkerk)*

Consultant: KZN Department of Health

Ventilation solution:

Ventilation grilles, swirl and ceiling air diffusers, fire dampers, sound attenuators, filter units, HEPA filters.



Filtered germ-free

Air conditioning the Inkosi Albert Luthuli Central Hospital in Durban (ZA)

This hospital, named after the South African Nobel Peace Prize recipient Inkosi Albert Luthuli, has 846 beds and 19 operating theatres.

TROX South Africa supplied all the important air conditioning and ventilation components for the central air-conditioning system, from simple ventilation grilles to swirl and ceiling diffusers, fire dampers, sound attenuators, air filtration equipment (ducted particulate air filter housings) and high quality HEPA filters for the operating theatres.

In the wards and offices, we used mainly ceiling diffusers that had been specially developed for the South African market. Together with temperature and duct pressure regulators coordinated to suit them, these air diffusers were a low-cost and reliable overall solution. The temperature regulators designed by TROX South Africa reported the room air temperatures, heating output, damper positions and set values to the central computer via a BMS system that monitored the levels and from which users could adjust the individual parameters. The TROX components easily maintained compliance with the narrow temperature tolerance limits specified for some wards.

The operating theatres were fitted with TROX HEPA filters. Each ceiling panel over an operating table includes six individual HEPA filters. The filters from TROX of Filter Classes H10 to U17 are subjected to 100% functional testing before delivery, ensuring that the TROX air conditioning components provide the highest levels of safety and reliability even in sensitive and safety-relevant areas.



Air filtration

The objective of air filtration is to use appropriate filter media and equipment to establish and maintain the level of cleanliness required for internal spaces. Air filtration is the most important procedure in a ventilation system, particularly in the case of clean room technology. Air filters in the form of fibre filters are used in various engineering areas. In air conditioning systems they are used as so-called standard air filters for removing coarse and fine dust out of the air, thus simultaneously protecting downstream equipment and system components. In clean room technology (such as in the industries of pharmaceuticals, medicine, microelectronics, etc.), systems require an additional particulate air filter to guarantee the high clean room classes required and to serve as laminar flow “distributors.”

The following types of filters are available:

- Coarse particle filters as filter media for automatic roll filters, as cut to size mats and as framed panel filter and roll media.
- Pleated filters/filter cells
- Bag filters made of high quality chemical fibre or glass fibre fleeces for cell frames in the standard market sizes.
- Mini-pleat filters as high performance filters for extracting fine dust, suspended particles and aerosols.
- Particulate air filter cells for areas with the strictest standards for air purity and hygiene.
- High performance filter panels for clean room technology

Filter units

Air filters remove contaminants such as dust, microbes and pollen out of the air. A variety of filter housings are available for the different installation situations, as part of a central air conditioning plant or for separate air filtering, for instance, of a contaminated, closed-off area. Filters are used both in room air conditioning systems for office buildings and for air filtering in production processes that create a lot of dust, as well as in sensitive areas such as microbe-free operating theatres or clean rooms in the pharmaceutical and microelectronic industries.



Inkosi Albert Luthuli Central Hospital, Durban (ZA)



Filter casings for duct installation

- These universal filter casings are used as primary and secondary filter levels in air conditioning systems.
- They can hold coarse, fine and suspended particle air filters, as well as activated carbon filters.

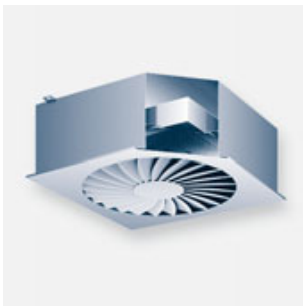
➔ 2,000 to approx. 40,000 m³/h, depending on the filter type as an individual system



Ducted particulate air filter (KSF)

- Ducted particulate air filters are used in areas with the highest air purity requirements, such as in the chemical and pharmaceutical industries or in both hospital and clean room technology.
- They can be installed as individual units for varying quantities of air or as a combination of up to six adjacent filter units.

➔ 500 – 4,000 m³/h, depending on the filter type.



High efficiency terminal filter

- High efficiency terminal filters are used as final filters in areas with the highest requirements for air purity and hygiene such as in the medical, biological and pharmaceutical industries as well as in other sensitive areas.
- Both HEPA and ULPA filters can be used.
- These filters can be combined with different ceiling diffusers from the TROX standard product range.

➔ 250 – 2,100 m³/h depending on the individual casing

Filters

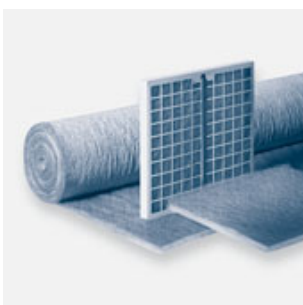
TROX provides filter media for its filter units for every application in industrial and clean room air conditioning systems.

Our programme includes coarse, fine and suspended particle air filters and activated carbon filters in Filter Classes G3 – G4, F5 – F9, H10 – H14 and U15 – U17.

Specially selected filter materials and the design of the filter elements guarantee low pressure drop and thus cost efficiency. All filters have been tested according to the norms valid in Europe and are available in all the standard market sizes. All filter media can be disposed of in household waste incineration plants, depending on the material chosen.



Municipal health care facilities, Düsseldorf (D)



Coarse filters

- Coarse filters are primarily used as prefilters to extract coarse to fine dust from room air conditioning systems.
- They are available as roll media, cut filter mats and frame filters.

Filter Class: G3 – F5
Nominal air stream velocity: 0.9 – 3.1 m/s, depending on the material.



Z-Line

- Z-Line filters are especially suited for installation in standard cell frames from TROX for wall and duct installation, as well as for the standard sizes found on the market.
- Because they can collect large quantities of dust with only low pressure drop, they have long service lives and maintenance intervals.
- They stand out for their relatively low weights and small transport volumes.

Filter Class: G4 – F5
 Filter frame: Stable craftboard frame



Bag filters

- Bag filter inserts are used as prefilters or main filters in room air conditioning systems, depending on the filter type, to extract coarse and fine dust.
- The stable plastic front frame ensures easy disposal.
- This filter is available in the widest variety of standard market sizes.

Filter Classes: G4; F5 – F9
 Bag filter lengths: 360 – 700 mm
 Filter frame: Plastic or galvanised sheet steel



Minipleat filter inserts and cells

- Minipleat or fine dust filters are used as prefilters and terminal filters in room air conditioning systems that require high processing volumes and long filter service lives.
- The minipleat filter's wedge shape increases the filtering surface area and thus ensures high quantities of air with low pressure drop.

Filter Classes: F6 – F9; H10 – H14
 Filter frame: Plastic, galvanised sheet steel or moisture-resistant fibre board.



Compact filters/Particulate air filters

- Compact fine dust filters were developed for gas turbines and industrial use, wherever operating conditions are rough and also for ventilation and air conditioning systems.
- They are designed to resist high fluctuations in pressure and are well suited for pulsating volume flows.


Filter Classes: F6 – F9; H10 – H13
 The filter frames are made of rolled galvanised or stainless sheet steel.



Minipleat filter panels

- Minipleat filter panels are used as prefilters for extracting coarse and fine dust or as high performance filters for extracting suspended particles, aerosols, toxic dusts, viruses, microbes, and the like from supply and exhaust air.

Filter Classes:
F7, F9; H11, H13, H14


 Filter frames made of aluminium, galvanised steel frames or fibre board.



Minipleat filter panels for clean room technology

- Minipleat filter panels for clean room technology meet the highest requirements for air purity and freedom from microbes in particularly sensitive areas such as the medical, pharmaceutical and microelectronic industries.
- They are installed as the terminal item in filter ceilings, filter walls, clean workbenches and air diffusers in which both the highest degree of cleanliness and also controlled air flow must be guaranteed.


Filter Classes:
H14, U15, U16, U17

 Filter frames made of aluminium



Activated carbon filters

- Activated carbon filters help adsorb odorous and harmful substances in gaseous form, such as in airports. They also help adsorb hydrocarbons and traces of inorganic compounds.
- They are available as panels, cells and cartridges for installation in walls and ducts in room air conditioning systems.

 Filter frames made of steel or moisture-resistant wood fibre, plastic.

Air filter costs are about 80 % energy costs. Their purchase, maintenance and disposal only amount to about 20 % of their overall costs. The material costs of one filter per work station and day run to 0.02 EUR for an office area of approx. 200 square meters and a service life of one year. That means 0.02 euros for clean air for each worker.

An unregulated laboratory fume hood costs approx. one euro per hour to run. Laboratory regulation systems from TROX, on the other hand, will reduce energy costs to up to 20 eurocents per hour. That kind of saving quickly makes up for any high investment costs.





Automated fire protection and smoke extract systems in a large open plan space

Using the TROXNETCOM® AS-interface in the IKMZ of the Brandenburg Technical University, Cottbus (D)

The ten-storey Information, Communications and Media Centre (IKMZ) of the Brandenburg Technical University (BTU) in Cottbus, Germany, has an exterior distinguished both by its spectacular curved shape and by its cavity wall glass façade on which letters have been screen printed. Inside, the architects decided to do without wall elements to a great extent, thus creating an open plan design.

This open plan design creates enormous problems for fire protection because it is very difficult to divide the area into fire compartments. That is why the responsible planners built, among other things, a water sprinkler fire extinguishing system as a technical substitute measure and defined especially high standards for the fire protection and smoke extraction plan.

TROX designed an automated smoke extraction system for the project based on TROXNETCOM® AS-i technology and in accordance with the SIL-2 classification that complies with the draft VDMA 24 200-1 of May 2004. The building is divided into 46 smoke extraction zones equipped with smoke detectors. Smoke extract is carried out by an automated smoke extract system, using fans and smoke extract dampers controlled, like the automated fire dampers, by the TROXNETCOM® AS-interface. TROXNETCOM® also regulates the make-up air openings and the smoke extraction of two stairwell halls. The TROXNETCOM® AS-i smoke extraction regulation works completely autonomously and signals all the hazard alarms from the building communication and control systems.

Project: IKMZ of the Brandenburg Technical University (BTU), Cottbus (D)
Owner: Brandenburg Technical University (BTU)
Architect: Herzog & de Meuron Architekten, Basel, (CH)
Mechanical services consultant: IKL + Partner Ingenieurgesellschaft mbH, Leipzig (D)
Contractor: Axima GmbH Mitteldeutschland GmbH, Dresden (D)
Fire protection and smoke detection system: TROXNETCOM® system with AS-interface for networking motorised fire dampers and smoke extract dampers.



TROX delivered a custom-tailored system solution based on the TROXNETCOM® AS-interface system in conjunction with TROX fire dampers and smoke extraction dampers that met the high safety engineering standards set by the experts.

TROXNETCOM®: Custom-tailored solutions for controlling and monitoring ventilation engineered components

Modern ventilation technology such as flow rate controllers, decentralised ventilation systems and systems to ensure human safety such as automation systems for fire protection and smoke extract communicate and work interactively. Data can be queried and displayed from the building communication and control systems. Remote querying via the Internet or mobile phone can subject the functionality of the systems to continuous checks while simplifying maintenance.

System safety is increased by its integration into the building management systems as malfunctions can be detected and eliminated immediately. Using the power lines for data communication purposes also eliminates the conventional wiring, reducing the fire loads in a building. Furthermore, the flexible usage required of buildings today is only achieved by the

use of modern communications and automation systems with which systems can be changed to meet adjusted requirements almost at the click of a button.

TROX provides its clients with custom-tailored solutions for the areas of fire protection, smoke extract, air flow rate control, decentralised ventilation, laboratory air regulation and controlling adjustable air diffusers.

TROX uses two systems to accomplish this: LON technology as an open standard in building automation, and the AS-interface, an internationally normed industrial bus system that has been authorised by the German TÜV authority for use in fire protection and smoke extraction (SIL 2 acc. to IEC/EN 61508) because of its high system stability and data safety.

TROXNETCOM® performance features

- Digital monitoring and control of fire dampers and smoke extraction dampers, as well as limit switch recording.
- Smoke detectors with construction authority approval for detecting smoke in ventilation systems and operating fire dampers.
- TÜV-tested compliance with the highest safety standards based on EN 61508 (VDMA 24200-1).
- Easiest startup based on TROXNETCOM® Basic User Software.
- Integrated maintenance routines for checking the functioning of the fire protection components, including documentation.
- Complete LONMARK® certified LON product portfolio for fire protection.
- LON components for controlling analogue volume flow rate controllers and adjustable diffusers.
- Custom-tailored LON regulators for controlling and monitoring decentralised ventilation equipment.
- LON lab systems for regulating air pressure in rooms and volume flow rates in laboratories.

Advantages

- Integration into almost any building communication and control systems
- Significant reductions in wiring costs
- Reduced fire loads
- Power line technology: 24 V and 230 V lines are simultaneously used for data communications.
- Flexible wiring options
- Easiest installation and startup
- Components are delivered to the construction site already wired for use
- High flexibility
- High degree of standardisation
- Highest levels of system, data and operating safety acc. to EN 61508
- Manufacturer independence due to our usage of an open standard [LON (ANSI CEA 709.1-4) and the AS interface (EN 50295, IEC 62026-2)]
- Reduced maintenance costs thanks to integrated function control of the fire protection systems, including documentation.

Ventilation solutions for laboratories



Safety, comfort and energy efficiency from one source

Laboratory air management at the Shanghai Institute for Organic Chemistry, Shanghai (PRC)

The new lab building at the Shanghai Institute for Organic Chemistry of the Chinese Academy of Sciences was opened in 2004. It has a total area of 16000 square meters and houses eight standard laboratories on each of seven floors, from the first storey to the seventh storey.

TROX worked out an energy-saving, safe and comfortable laboratory air management system for the building. The building has been divided into 14 zones. Each zone contains four lab areas with six lab fume cupboards each. A permanent negative pressure of 10 Pa has been ensured in all the lab areas under any operating conditions. The regulators for this total of 336 lab fume cupboards and the room air regulators are coordinated and managed by LONWORKS®.

Each fume hood has been equipped with an infrared sensor that records the presence of lab personnel and switches off the fume cupboard in an energy-saving mode when no lab technicians are present. Night time and special operating modes can also be switched on automatically. Need-based adjustment of the volume flows thus ensures both the highest degree of safety and also more comfort and significant energy savings.

A remote monitoring system can be added to this solution at any time to enable access to the LABCONTROL regulator from around the world. In addition to functional analysis, these systems enable the modification of all the system parameters, including time switching, set volume flow values, room pressures or defined setback operation modes.



Project: Shanghai Institute of Organic Chemistry, Shanghai (PRC)
Owner: Chinese Academy of Sciences
Architect: Perking & Well, USA
Lab consultant: The Second Institute of Project Planning & Research, Ministry of Machinery Industry, China
Ventilation solution: LABCONTROL fume cupboard controllers and room air controllers fitted out with LONWORKS® networking

LABCONTROL: Custom-tailored solutions for a safe and energy-saving lab air management system

Room ventilation systems in laboratory buildings must fulfil complex and strict requirements. Protecting lab personnel and reducing energy consumption to the lowest possible levels – Those are the central objectives.

The LABCONTROL SYSTEM from TROX provides custom-tailored solutions that comply with these standards – from controlling and monitoring individual lab fume hoods or rooms, all the way to complete ventilation systems for entire lab buildings. And of course we maintain compliance with all the applicable norms, such as DIN 1946 Part 7 and EN 14175.

Both the fume hood controller and the room balance controllers have very short reset times and are electronically networked, guaranteeing an instant, continuous room pressure balance at constant temperature when the fume hood is

switched on and off. The LABCONTROL family of products also includes electronic and pneumatic controller variants specially custom-tailored for these requirements.

That is why our system solutions can be used in hospital areas or in the pharmaceutical industry to maintain both the specified air flows and the thermal room climates.

Our electronic controllers use analogue and digital signals (LONWORKS®) to communicate. The efficient central recording and display of all system parameters, including e.g. alarm messages, also increase safety. And the wide range of modification options allows you to build more flexible systems, while remote accessing enables diagnosis and adjustment that won't cost you a lot of man-hours.

LABCONTROL performance features

- Digital volume flow rate controllers for fume hoods and room balance control based on modern communications systems such as LONWORKS® technology
- Volume flow control and monitoring of lab fume hoods (variable, constant, two-point)
- Regulation option for room pressure and room temperature, as well as control and monitoring of diversity factors
- Option for connecting external displays for fast querying of the volume flow controller's system status, e.g. for diagnostic purposes
- Range of control panels for fume hood monitoring, featuring different ranges of functions
- VAV controllers made of tough materials such as polypropylene or stainless steel
- Removable differential pressure sensors for an easy-to-clean volume flow measurement sensor system
- Volume flow controllers certified for potentially explosive areas (Ex zones)
- Autonomous monitoring systems for laboratory fume cupboards
- Room pressure monitoring systems for displaying the room's current air pressure with optical and acoustic alarms

Advantages

- Competent advice and support during all the phases of a project, from the planning to the hand over, and during operation as well
- Production-accompanying service package: Start up, system integration, maintenance and up dating concepts
- Easy networking to superordinated systems through the use of standardised interfaces
- Greatest possible data transparency through the use of open systems (LONWORKS®, BACnet)
- One-stop provider of ventilation system solutions, reducing the number of interfaces required
- Reduction in fire loads thanks to significant reductions in wiring required for the bus technology used
- Supports more flexible usage concepts: The systems can be easily modified to meet new standards
- Rapid amortisation of investment costs thanks to reductions in operating costs
- Reduced power consumption due to optimised operation of the systems
- High level of operating safety because the systems monitor themselves
- Option of remote access to bus systems for diagnosis or modification purposes

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