

FläktGroup®

A **SAMSUNG** COMPANY

Engineered for Pharma

» SPECIALISED HVAC AND CLEAN ROOM SOLUTIONS
FOR HIGH DEMANDS OF PHARMACEUTICAL APPLICATIONS



With experience from over 500 installations in pharmaceutical facilities worldwide, FläktGroup is the ideal partner for new builds, extensions or refurbishments. Our extensive GMP* compliant product portfolio provide solutions to the stringent demands of the pharmaceutical industry, whether it is clean room environments, labours, manufacturing facilities, offices or warehouses. Our systems meet several demands whilst achieving the highest standards of energy recovery and efficiency to ensure the lowest life cycle costs for the entire building.

*GMP: Good Manufacturing Practice



HVAC Solutions

Service & Controls

Decentral Air Conditioning

Environmental control

Hygienic building components

Air filtration

Customisation

Life safety

EXCELLENT, PROOFED PHARMA SOLUTIONS

Energy efficiency

GMP compliant

ISO conforming

Hazard control

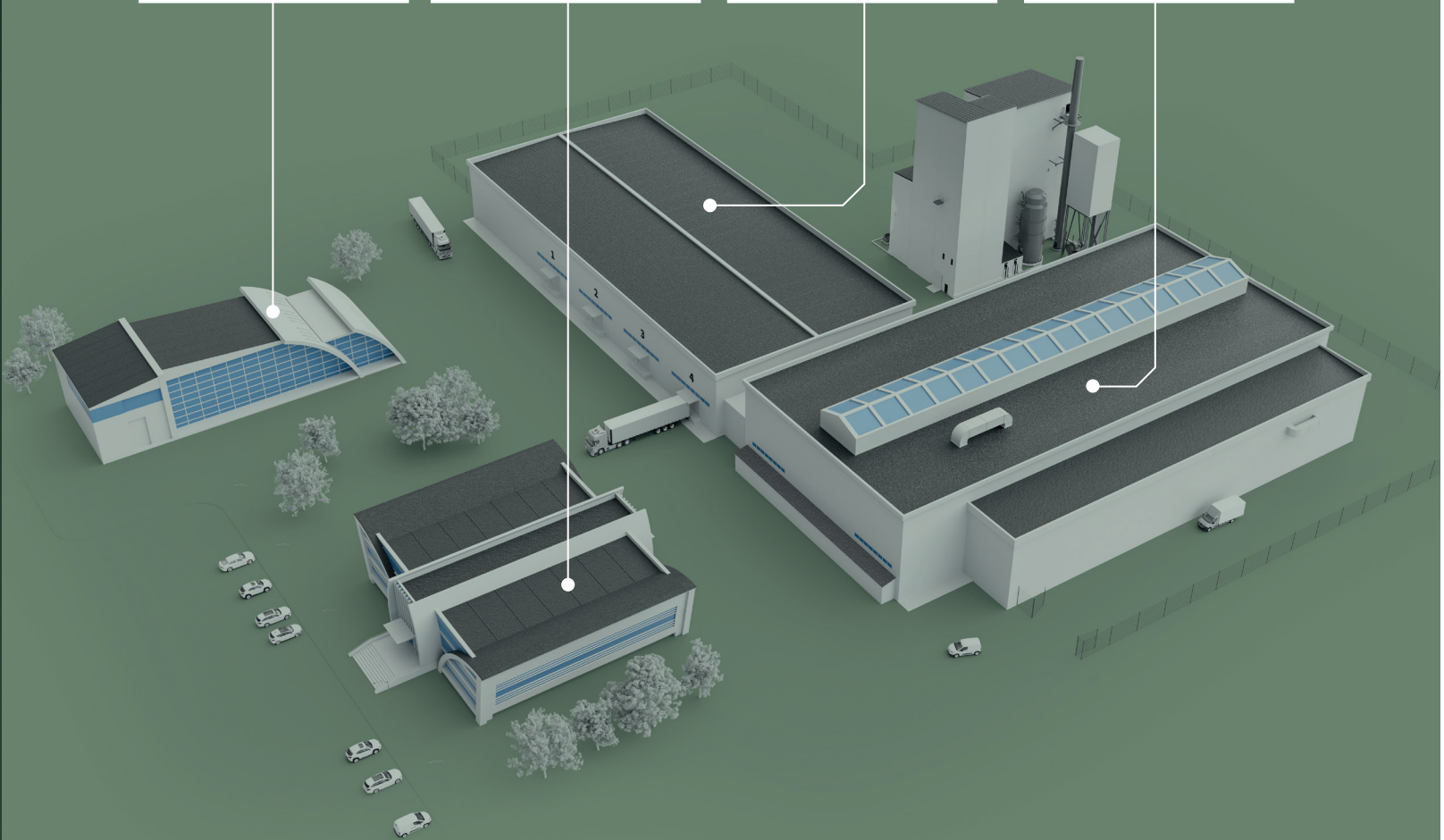
FläktGroup is not only an highly experienced systems integrator. We also produce most of the components and products ourselves. That puts us in the unique position where our systematic demands can be closely met by component features. The development, integration and service is always done with the functionality and needs of the entire system in mind.

WE ARE YOUR
**SINGLE-STOP
SOLUTION PROVIDER
WITH PASSIONATE
ATTENTION TO DETAIL**
FOR ALL YOUR
CLEAN AND CRITICAL
ENVIRONMENTS

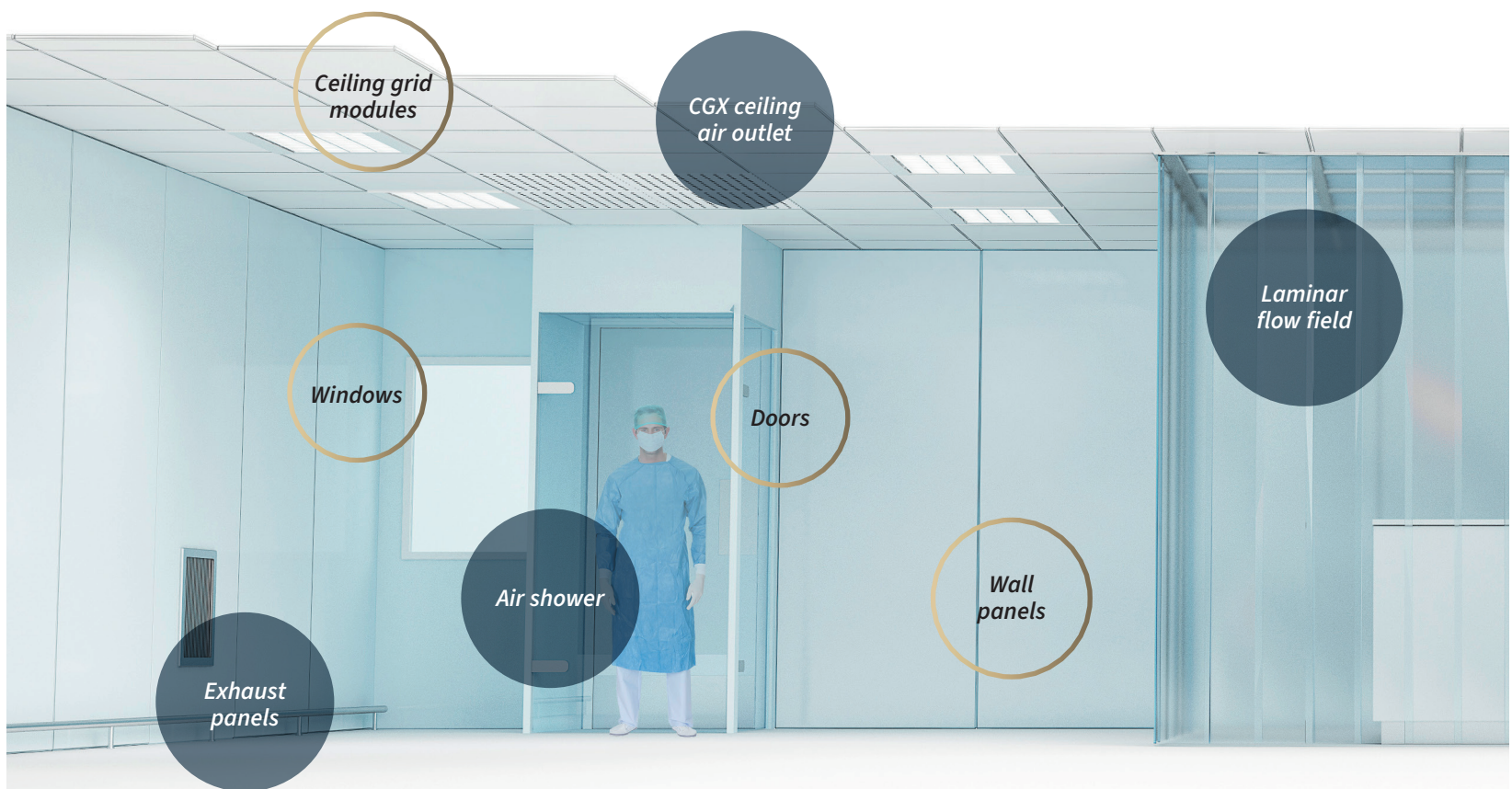
For any process, whether human, mechanical or chemical, the condition of the surrounding air is vital. Not only does the air have to be clean, but it also has to be the correct temperature, correct humidity, be odourless, and contain the correct amount of fresh air. It has to be introduced into the space so that there is very little noise and very little draught. For clean rooms surfaces need to be accurately controlled to maintain velocities, patterns or pressure cascades.

FläktGroup not only has the most comprehensive product portfolio in the market – we develop and manufacture our own systems to take all of the above factors into consideration.

Lab, QC, R&D	Office/administration areas	Warehousing	Production and Packaging
<ul style="list-style-type: none"> • Filtration • HVAC • Building Elements • Service & Controls 	<ul style="list-style-type: none"> • HVAC • Decentral Air Conditioning • Service & Controls 	<ul style="list-style-type: none"> • HVAC • Decentral Air Conditioning • Service & Controls 	<ul style="list-style-type: none"> • Filtration • HVAC • Building Elements • Service & Controls



WE BUILD TO ENSURE **PERFECT AIR CONDITIONS** IN EVERY WAY



Air Handling Units



Ceilings

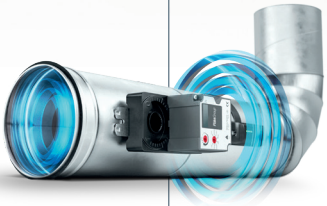
Fresh Breeze fan-filter unit

Signalisation of door opening

Monitoring

Pass through boxes

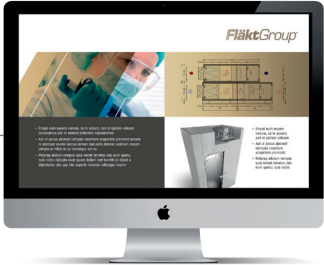
Fresh Breeze BOXX closed working environment



Ultrasound VAV



Chillers



Systems for documentation and control



YOUR **BENEFITS**

LESS COORDINATION AND INTERFACES

- We are your system provider and one stop supplier
- We have a deep in-house value chain available
- We provide global reach combined with local knowledge
- We use high quality components such as heat recovery elements made by ourselves

HIGH QUALITY YOU CAN RELY ON

- We deliver products from our own high-end manufacturing set-ups in Europe
- We have many years of experience

YOUR ONE STOP CLEAN ROOM SPECIALIST

- We are your single door for the complete clean room build (shell and space itself)
- We bring air from the outside into the clean room in the right quality with all the necessary air treatment processes

YOU GET, WHAT YOU REALLY NEED

- We adapt the products to your requirements

LOW LIFE CYCLE COSTS

- We use the most efficient HVAC solutions

WE FOCUS ON YOUR NEEDS



“Safety and hygiene are my top priority. Simple cleaning reduces the risk of possible contamination.”

Hygiene controller

“I need an efficient planning process with reliable data & technical support.”

Building planner



“A reliable system and low service costs are important for my work.”

Operator/building manager

“For me, the investment must pay off. Low operating and service costs are crucial.”

Investor/contractor

“A smooth project and a simple and efficient installation are crucial for my success.”

Plant engineer/plumber

“I need a comfortable and hygienic working environment in which I can feel at home and at the same time be safe and efficient.”

Scientist

First class products and components

CLEAN ROOM COMPONENTS



LAMINAR AIRFLOW UNIT – FHM(P)

- Provides product protection by supplying a clean air supply over the product, minimizing the risk of contaminants from surrounding areas
- Air delivered 100% from AHU or recirculation (equipped with fans)
- Casing in stainless-steel or steel in RAL9010
- Tailored dimensions with LED lighting and control unit
- Heat exchanger optional
- Various designs for return air sections



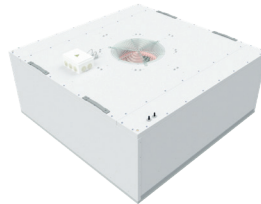
TERMINAL HEPA DIFFUSER – CGX

- For turbulent airflow
- Suitable for all types of suspended ceilings produced for clean rooms
- Vertical or horizontal inlet with airtight shut-off damper operated from room side, that ensures safe HEPA filter replacement
- Round or rectangular duct connection
- HEPA filters (H14-U15) in an aluminum frame with PUR gasket or gel seal



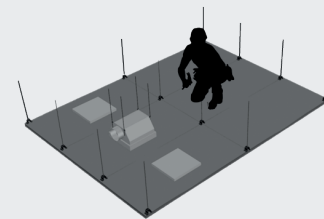
AIR SHOWER

- Active personnel airlock with an access control
- Decontamination is performed by clearing off dust and dirt particles from bodies of cleanroom personnel
- Maximum efficiency through a high-velocity turbulent jet of clean air of 25 m/s
- Cleaning cycle according to customer settings
- Filtration using a pre-filter and HEPA filter



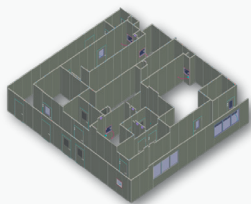
FAN FILTER UNIT – FRESH BREEZE

- Sizes: 600x1200 mm (1160 m³/h) and 1200x1200 mm (2330 m³/h)
- Light aluminum casing, optionally in RAL9010
- EC fans
- Constant airflow optional
- H13 or H14 filters
- Fluid gel gasket on filters
- Validation probes
- Cooling coil and prefilter optional
- Local control (0–10 V) or centralized control via BMS (MODBUS RTU)



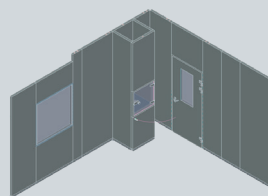
CEILINGS

- Thanks to the full range of cleanroom ceiling systems (RS panel ceiling, KS grid ceiling, LS clip-in ceiling), the solution can be adapted to any project requirement
- Designed for easy integration of HEPA diffusers, LED lighting, FFUs, LAFs, and other ceiling-mounted components
- A smooth, disinfectant-resistant surface enables efficient cleaning and sanitation
- Joints between panels are sealed using permanently elastic sealant
- Walkable ceiling systems designed for safe access from above when required



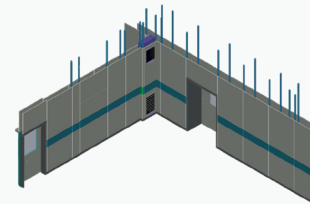
SANDWICH PANELS

- Painted or stainless steel sheet facing, custom design colours, various cores with no release of particles
- Matching flush doors and glazing panels for nonopening windows
- Rounded connections to floors and ceilings and rounded internal wall corners enable easier cleaning and prevent particle buildup
- Optional enhanced fire resistance, integrated wiring trays for cables, installation panels for concealed pipe routing, and exhaust-air panels to maximize usable room area



DOORS AND WINDOWS

- Doors and glazings flush with wall partitions and facings
- Interlock control system with signalling panels
- Doors on hinges and sliding doors, manually or automatically operated
- Single and double leaf doors with automatic drop-down seal
- Passive or semi-active pass-through boxes featuring integrated filtered air delivery and interlocked ESG glass doors



FACINGS

- Inwall Click facings for easy fixation to structural walls by means of click profiles
- Cost effective solution to adapt existing rooms into clean rooms
- Inwall OT+ facings attached to steel structure of profiles fixed between floor and concrete ceiling
- Facing panels are made of coated steel sheets with a smooth, easily disinfected surface and plasterboard reinforcement for rigidity
- The system is complemented by dedicated doors and glazing, as well as furniture and exhaust-air ducts integrated flush with the facing surface
- Optional X-ray protection, heating panels, and antibacterial PVC coating

HVAC SYSTEMS

AIR HANDLING UNITS

- Modular system with high flexibility of the component arrangement (one above the other, side by side, one behind the other, standing)
- Air volumes of 500–100.000m³/h
- Certifications (Eurovent & RLT equipment, hygiene VDI6022, DIN EN1946 part 4, ...)
- Aluminum frame construction AlMgSi 0.5 with/without thermal break
- Casing Characteristic EN1886 (M: T2/TB2; L1; D2; F9); Performance characteristics according to EN13053, based on DIN EN 13779



CHILLERS

- Free-Cooling chillers with maximum efficiency for process applications with continuous cooling loads
- Cooling capacities from 35 kW to 1,3 MW



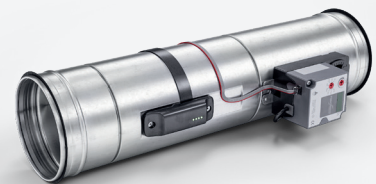
EXHAUST FANS

- Aerodynamic efficiencies up to 77%
- High Efficiency impeller design
- Adjustable pitch impeller delivers precise performance
- Short or Long cased options provide installation flexibility



FIRE & SMOKE SAFETY DAMPERS

- Fulfil requirements for various fire and leakage classes
- Built-in actuator or fuse link mechanism
- Easy installation
- Fire Safety Control System (ISYteq FICO) available for monitoring and testing

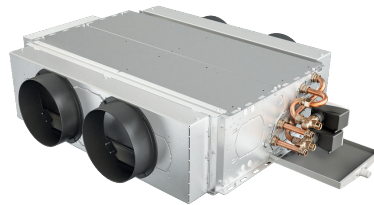


OPTIVENT® ULTRA, VAV

- Low noise level
- No safety distance to bends and T-pieces
- High accuracy in the whole airflow range and excellent resilience to dust
- No pressure drop and a broad manageable airflow range

First class products and components

DECENTRAL AIR CONDITIONING



FAN COILS

- Highest comfort standards due to optimal room temperature control system
- Easy to clean and disinfect
- Wide range of "Plug and play" accessories that are factory mounted
- Low sound power level – 1.8kW total cooling capacity with <30 dB(A) sound pressure
- Eurovent and VDI 6022 certified



HYGIENE CHILLED BEAMS

- Modern, flexible design
- Easy to clean without tools: coated coil for smooth surface
- Energy efficient
- Limited maintenance without moving parts and without condensate tray
- Easy installation



AIR TERMINAL DEVICES

- Round or rectangular ceiling mounted nozzle diffusers
- Adjustable nozzles for setting different diffusion patterns
- Low noise level
- Suitable for both suspended and false ceiling built on site



AIR CURTAINS

- Industrial and commercial versions
- Easy installation and carefree maintenance
- Electric, hot water or ambient heating
- Energy efficient
- Low noise



UNIT HEATERS

- Affects a reduction in the air stratification
- Application-specific material properties
- Flexible selectable components
- ErP 2016 conform (Ecodesign Directive)
- Hygienic characteristics with the VS variant



PRECISION AIR CONDITIONING

- Wide variety of versions, sizes and options
- Scalable output
- Energy efficiency design
- Redundancy and networking features inbuilt reducing operational risks

Standard/guideline		Class						
ISO 14644-1			8	7	6	5	4	3
GMP at rest			D	C		A+B		
GMP in operation		D	C	B		A		
Max amount of particles per m ³ (ISO 14644-1)	≥ 0,1 µm	Not defined			1.000.000	100.000	10.000	1.000
	≥ 0,2 µm	Not defined			237.000	23.700	3.370	237
	≥ 0,3 µm	Not defined			102.000	10.200	1.020	102
	≥ 0,5 µm	Not defined	3.520.000	352.000	35.200	3.520	352	35
	≥ 1 µm	Not defined	832.000	83.200	8.320	832	83	8
	≥ 5 µm	Not defined	29.300	2.930	293	Not defined		
Recommended limits for microbial contamination (GMP in operation)	Air sample (CFU/m ³)	200	100	10		No growth		
	Settle plates (Ø90 mm) (CFU/4 hours)	100	50	5		No growth		
	Contact plates (Ø55 mm) (CFU/plate)	50	25	5		No growth		
	Glove print 5 fingers (CFU/glove)	-	-	5		No growth		
Recommended shape of airflow	Non-unidirectional (turbulent)	Non-unidirectional (turbulent)	Non-unidirectional (turbulent)	Non-unidirectional or mixed	Unidirectional (laminar)	Unidirectional (laminar)	Unidirectional (laminar)	
Air changes examples 1/h		10–20	30–70	70–160				
Average air flow velocity m/s		-	-	-	0,2–0,5	0,3–0,5	0,3–0,5	
Recommended terminal filter class	E11/H13	H13	H13	H14	H14	U15	U15–U17	

GENERAL REQUIREMENTS ON INTERNAL CLEAN ROOM SURFACES:

Smooth, non-porous, continuous surfaces

- All internal surfaces are smooth, impervious, non-porous, and unbroken to minimize particle shedding, microbial growth, and contamination retention.

Designed for effective and frequent cleaning

- Surfaces are compatible with repeated cleaning, disinfection, and sporicidal procedures without degradation.

Minimization of contamination traps

- Recesses, ledges, and unnecessary corners are avoided. Interior design minimizes features where particles or contaminants can accumulate.

Optimized junctions and corners

- Wall-to-floor, wall-to-ceiling, and internal wall-to-wall junctions are carefully detailed using radiused, varnished aluminum profiles, preventing particle retention and facilitating effective cleaning.

Sealed and tight construction

- Ceilings, wall systems, and penetrations (e.g. for lighting and air diffusers) are sealed with permanent elastic silicone to prevent ingress of particles or contaminants from adjacent spaces or ceiling voids. This supports achieving the required pressure cascade.

Material selection with functional durability

- Materials and surface finishes, such as coated metal sheets and varnished aluminum profiles, minimize particle generation and provide appropriate chemical and stain resistance for cleanroom operation.

Doors, glazing and pass-through hatches

- Glazing panels are non-opening windows, smoothly framed, flush-mounted, and double-glazed using safety glass.
- Hinged doors are a preferred solution for clean room applications, offering a flush design without recesses, thresholds, or other hard-to-clean details.

- Sliding doors, although available, are generally not recommended, as their design may introduce recesses and ledges prone to dust accumulation.
- Enhanced airtightness is achieved through drop-down seals and continuous profiled gaskets, supporting stable pressure conditions and contamination control.
- In airlocks, doors are equipped with interlock control systems, signalling panels and door closers, ensuring safe operation and preventing the simultaneous opening of doors leading to the clean room.
- Pass-through hatches (transfer boxes) may be passive or flushed with filtered air and are equipped with interlock systems to ensure safe material transfer between rooms.

Service and support, close to you

SERVICE AND CONTROLS



DESIGN

- Tailor-made 3D assembly drawing of a clean room

INSTALLATION

- Safe, efficient installation
- Commissioning
- Training for operators
- Expert support from day one

CONTROL AND BMS

- Alarm notification
- Parameter definition
- Individual procedure selection
- Active monitoring
- Performance check

A local partner with global reach

All our research, development and testing activities, at our eight Centres of Excellence, are singularly focused to provide our customers with the best possible solution to their ventilation and indoor climate challenges. From new and innovative concepts, material choices and manufacturing processes to minimised running cost, easy commissioning and low maintenance we always strive to deliver the best for your application.



3500 talented employees



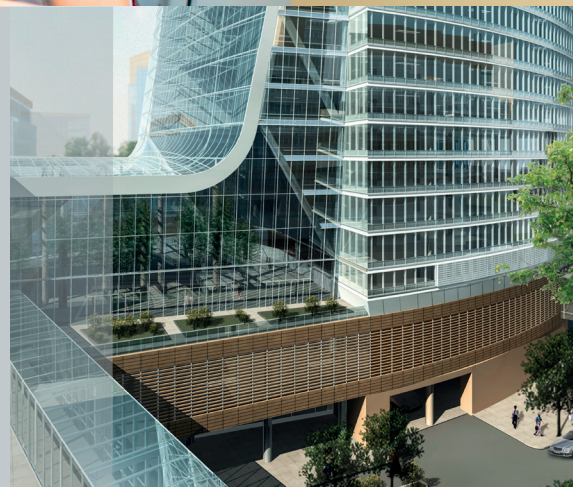
700M € turnover



65 countries worldwide



14 manufacturing sites



FläktGroup®

A **SAMSUNG** COMPANY

FläktGroup, a Samsung company, is a leader in air technology, delivering best in class, innovative and energy-efficient HVAC solutions, whilst reducing customer's carbon footprint.

FläktGroup's premier brands have been setting technological standards for more than 100 years and can fulfil the most demanding customer requirements.

Headquartered in Germany, FläktGroup operates all over the world with production sites across Europe, Asia, and the USA.

PRODUCT FUNCTIONS BY FLÄKTGROUP

Air Movement | Air Treatment | Air Diffusion | Air Filtration

Air Management & ATD's | Air Conditioning & Heating

Data Centre & IT Cooling | Service

» Learn more on
www.flaktgroup.com
or contact one
of our offices