



weisstechnik[®]
a schunk company

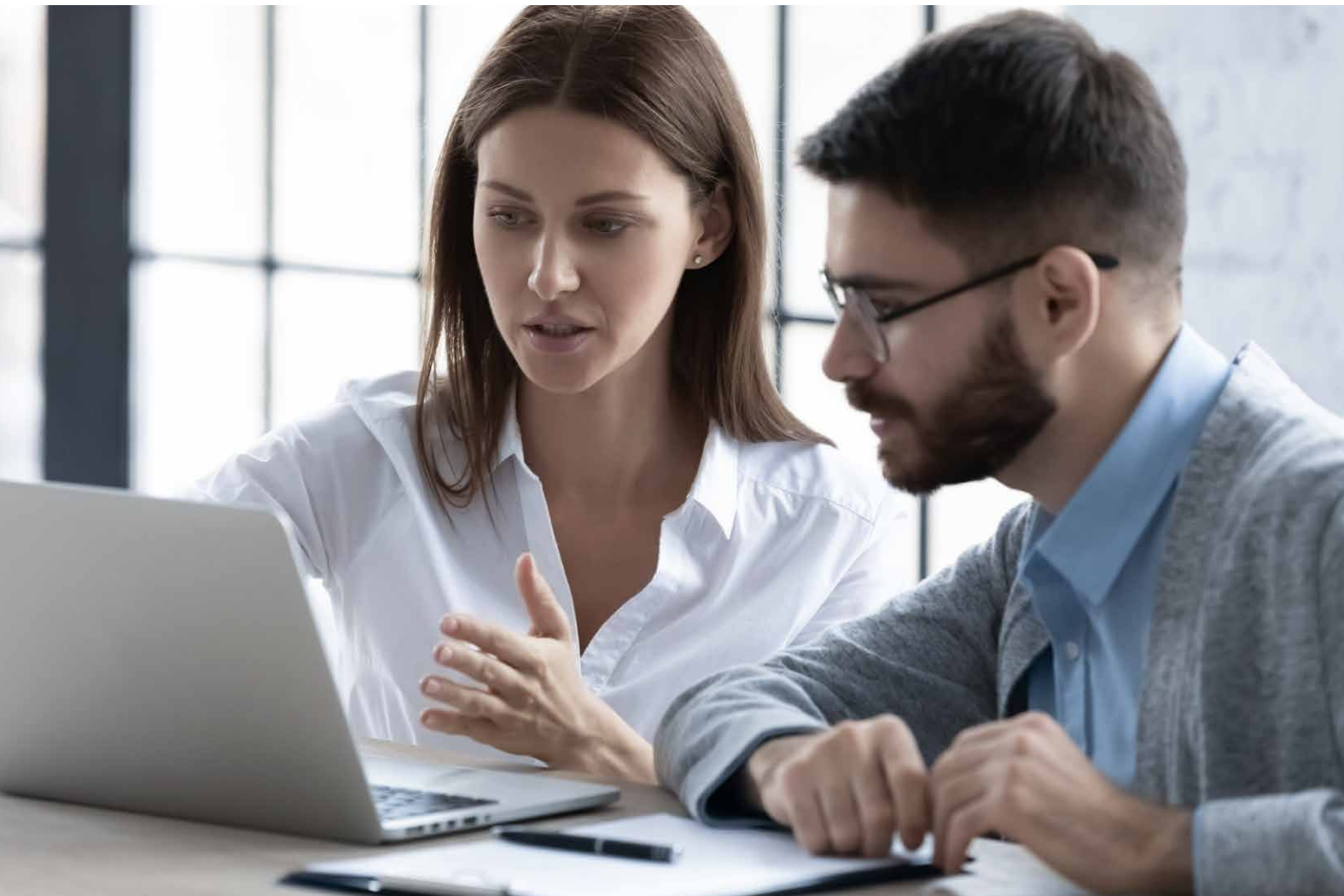


Vindur[®] Turnkey.
The key to a
perfect climate.

www.weiss-technik.com

Pure climate. In any case.

You want to reliably ensure constant climatic conditions for people, processes and products?
We can support you in this.



More safety becomes a competitive advantage.

Quality requirements in production are continually growing, processes are becoming more complex and the handling of sensitive substances is increasing. In laboratories, development and production departments as well as quality assurance increasingly more efficient solutions for air-conditioning and creating clean conditions are ever more in demand. Protect your employees, processes and products efficiently with our innovative solutions.

Turnkey clean rooms, measuring rooms and process climate systems.

weisstechnik is one of the world's leading specialists for particularly clean and constant climate conditions in production, research and development. We offer innovative, customised and high-precision solutions for all industries and scientific institutions - all from a single source. Always in compliance with all relevant standards, laws and guidelines. That's something you can rely on.

Vindur Turnkey – innovative complete solutions.

Individual Clean Rooms, Measuring Rooms and Process Climate Systems for your industry.

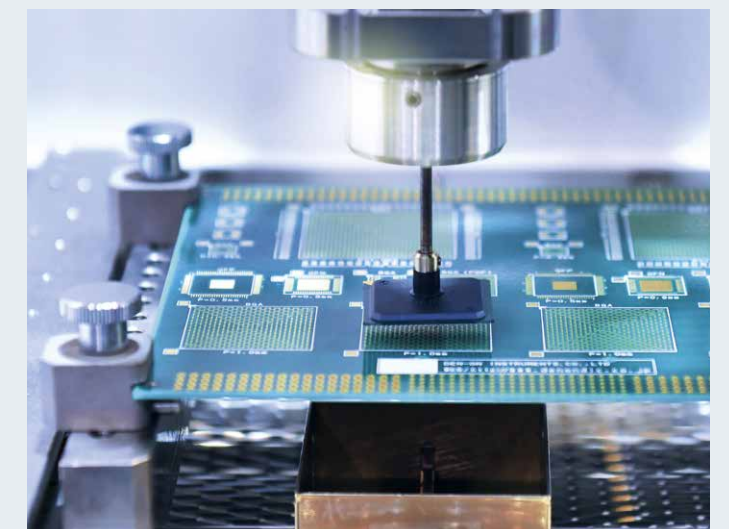
Always everything reliably under control.

Turnkey solutions from **weisstechnik** guarantee the required climate and purity conditions as well as the demanded air purity. Temperature, air pressure, humidity and velocity as well as particle and germ load can be taken into account. With intelligent monitoring systems, you can reliably supervise and document all parameters and ensure traceability.



Well-thought-out all-round package.

weisstechnik offers you customised air-conditioning and clean room solutions from a single source. Ideal for new buildings and conversions or for extensions and modernisations of existing rooms, systems and installations. We plan, develop and install systems, which we then commission and qualify or re-qualify as needed, according to GMP Annex. Our maintenance and repair services create a particularly high level of operational reliability for you.



Know-how creates trust.

Leading companies in all industries worldwide rely on the innovative solutions of **weisstechnik**. With our many years of experience, comprehensive process knowledge and a great deal of technical expertise, we are always in a position to realise even the most complex requirements from a single source. This saves time and money and guarantees you optimum results.



Always the right choice.

Future-proof and efficient Vindur Turnkey Solutions from weissttechnik.

Higher demands on product quality and increasingly stricter safety standards will make it even more important to ensure optimal climate conditions and the required air purity. We develop individual solutions for your demanding processes.

Vindur Turnkey Clean Rooms

Our Clean Room and Containment Solutions ensure particularly clean, low-particle air conditions and exactly the climatic conditions you need for a product or process.

Vindur Turnkey Measuring Rooms

Our Turnkey Measuring Rooms create extremely constant and precisely defined temperature, humidity and measuring conditions for sensitive products. The most diverse parameters can be set for you according to your needs.

Clean Rooms

Measuring Rooms

Process Climate Systems

Dry Rooms +
Customised Solutions

Vindur Turnkey Process Climate Systems

Our system solutions for the process climate ensure that all climate conditions are continually met at any time and that your processes can take place optimally.

Vindur Turnkey Dry Rooms + Customised Solutions

In addition to our customised solutions, we also plan and implement all other individual climate concepts for you professionally and in line with your needs - all from a single source. Give us a challenge!

Benefit from our 360-degree expertise.

Flexible service modules from weissttechnik for all your individual air-conditioning requirements.

Consultation and planning.

With our own planning service, we provide you with comprehensive advice on technical possibilities, process requirements and normative specifications. We prepare the basic evaluation, preliminary planning, feasibility study, profitability calculation, master plan, design planning, implementation planning and provide support in dealing with the authorities as well as in the approval process.

Agile project management.

Thanks to proven engineering and development processes, we ensure the smooth determination and implementation of all requirements for you. We work with agile project management methods and selected data processing systems such as 3D, CAD, BIM and simulations.

Installation service and commissioning.

We are also extremely efficient in the service we provide for you. We thus ensure the fast and professional installation and safe commissioning of the systems. All Service Employees are excellently qualified and - thanks to regular training - always up to date with the latest technical and normative knowledge.

One-stop supplier for turnkey solutions.

- New construction of Clean Rooms, Measuring Rooms, Process Climate Systems and Dry Rooms
- Conversion and modernisation of existing rooms and installations
- Customised solutions for individual requirements

Our Vindur Turnkey Components at a glance.

We develop and produce high-performance and highly reliable basic components for clean rooms and measuring rooms. We also carry out modifications according to your needs and develop customised solutions for you.

- Wall, ceiling and floor systems
- Climate and refrigeration technology
- Filter Fan Units (FFUs)
- Monitoring systems
- Personnel and material locks
- Workbenches and laminar flow units
- Safety workbenches
- Isolators
- Media supply, electric and MCRT

Design and execution.

For the design, we use our product portfolio, which meets the highest air-conditioning requirements. Of course, we can also integrate existing system parts or components from other manufacturers for you on a project-specific basis and coordinate all components and interfaces.

Qualification and re-qualification.

We create the qualification master plan (QMP) for you and carry out risk analyses (RA), design qualification (DQ), installation qualification (IQ) and functional qualification (FQ). In addition, we carry out qualifications and re-qualifications as well as hygiene measurements.

After-sales service worldwide.

We offer fast and competent service for our facilities throughout the entire life cycle. You benefit from our large spare parts stock and excellently trained Service Specialists. We maintain, repair and modernise equipment and offer training and education for our customers.

Always up to date!

In order to meet all requirements at any time, we always keep an eye on all relevant standards, laws and directives for you. We actively participate in standards committees and consistently train our specialists. In this way, we realise solutions that are as reliable as they are future-proof.

Expertise pays off for everyone.

Vindur Turnkey from weissttechnik - the industry-specific key to optimal solutions.

Our many years of global experience in climate technology, broad industry expertise and process reliability enable us to specialise in the development of individually planned and turnkey clean rooms, measuring rooms and process climate systems for all industries. With Vindur Turnkey, we offer you future-proof, efficient and economic climate technology from a single source.

Life Sciences

- Pharmaceutical industry
- Medical technology
- Pharmacies
- Genetic engineering and biotechnology
- Active ingredient production
- Laboratories
- Optics



Automotive + Aerospace

- Vehicle manufacturers
- Manufacturers of aerospace technology
- Suppliers
- Battery production



Electronics

- Microelectronics
- Optoelectronics
- Micromechanics
- Nanotechnology
- Photovoltaics



Food + Beverage

- Food industry
- Beverage industry



Pharmacies, medical devices, pharmaceuticals.

Vindur Turnkey - maximum safety for medicinal products and medical devices.



Standards/laws/guidelines	Clean Room	Measuring Room
EU GMP Guidelines	●	
FDA 21 CFR Part 11	●	
DIN EN ISO 14644 (VDI 2083)	●	
VDI/VDE 2627	●	●
VDI 6022	●	●
DIN EN ISO 16232 (VDA 19)	●	●
DAkKS	●	●

Whether in the production of cytostatics, the filling of eye drops or the manufacture of customised prostheses: our top priority is the protection of patients and employees. This requires absolutely controllable conditions. You can secure these with Vindur Turnkey Clean Rooms and Measuring Rooms. You can rely on the needs-based and future-proof planning and implementation of weisstechnik.

Competently advised.

weisstechnik has been a partner of pharmaceutical companies, medical device manufacturers, pharmacies and laboratories for many decades. We know the products and processes just as well as the legal requirements, the economic demands and the industry-specific peculiarities. On this basis, we support you holistically and offer you a clear knowledge advantage in your Vindur Turnkey projects.

Optimally protected.

The safety of processes, the purity of products and the protection of the environment from contamination by hazardous substances are elementary tasks for climate technology in the life sciences industry. It is important to have all currently applicable standards, laws and guidelines in view at all times. That's why we plan our climatic Vindur Turnkey Solutions to be robust and future-proof so that your company and employees are protected from all hazards.

Our solutions for the industry:

- Clean Rooms
- Measuring Rooms

Your matching Vindur Turnkey Components:

- Wall, ceiling and floor systems
- Climate and refrigeration technology
- Filter Fan Units (FFUs)
- Monitoring systems
- Personnel and material locks
- Workbenches and laminar flow units
- Safety workbenches
- Isolators
- Clean room furniture

Vehicles, aerospace technology, battery production.

Vindur Turnkey - controlled climate for research, development and production.



Standards/laws/guidelines	Clean Room	Measuring Room	Semi-Clean Room	Dry Room
DIN EN ISO 14644 (VDI 2083)	●			●
DIN EN ISO 16232 (VDA 19)			●	●
VDI/VDE 2627		●		
VDI 6022	●	●	●	●

Many electronic vehicle components are extremely sensitive. They require special environmental conditions during development, production and assembly. We offer you perfect and safely reproducible climate conditions with Vindur Turnkey Dry, Clean and Measuring Rooms. Simply outdrive the competition with weissttechnik!

Highly dry and pure.

As an experienced climate technology specialist, we supply numerous companies in the automotive industry. For example, our **Vindur Turnkey** Dry Room Systems ensure a dry, clean climate in the production of lithium-ion batteries for electric vehicles. Our highly efficient adsorption dehumidifiers are central basic components. With an extremely low residual water content of up to 0.001 g/kg air and a dew point of -70°C , you realise maximum dehumidification performance.

Clean and precise.

We are familiar with the process requirements of the automotive industry and develop clean and semi-clean rooms for sensitive electronic components. **Vindur Turnkey** Semi-Clean Rooms are the ideal solution when the particle size, which is critical for product safety, is higher than the maximum specification according to clean room standards. For example, in the assembly of injection and ABS systems. We also create air-conditioned measuring rooms for you. For example, for the precise quality assurance of engine and transmission components as well as other parts with minimal manufacturing tolerances.

Our solutions for the industry:

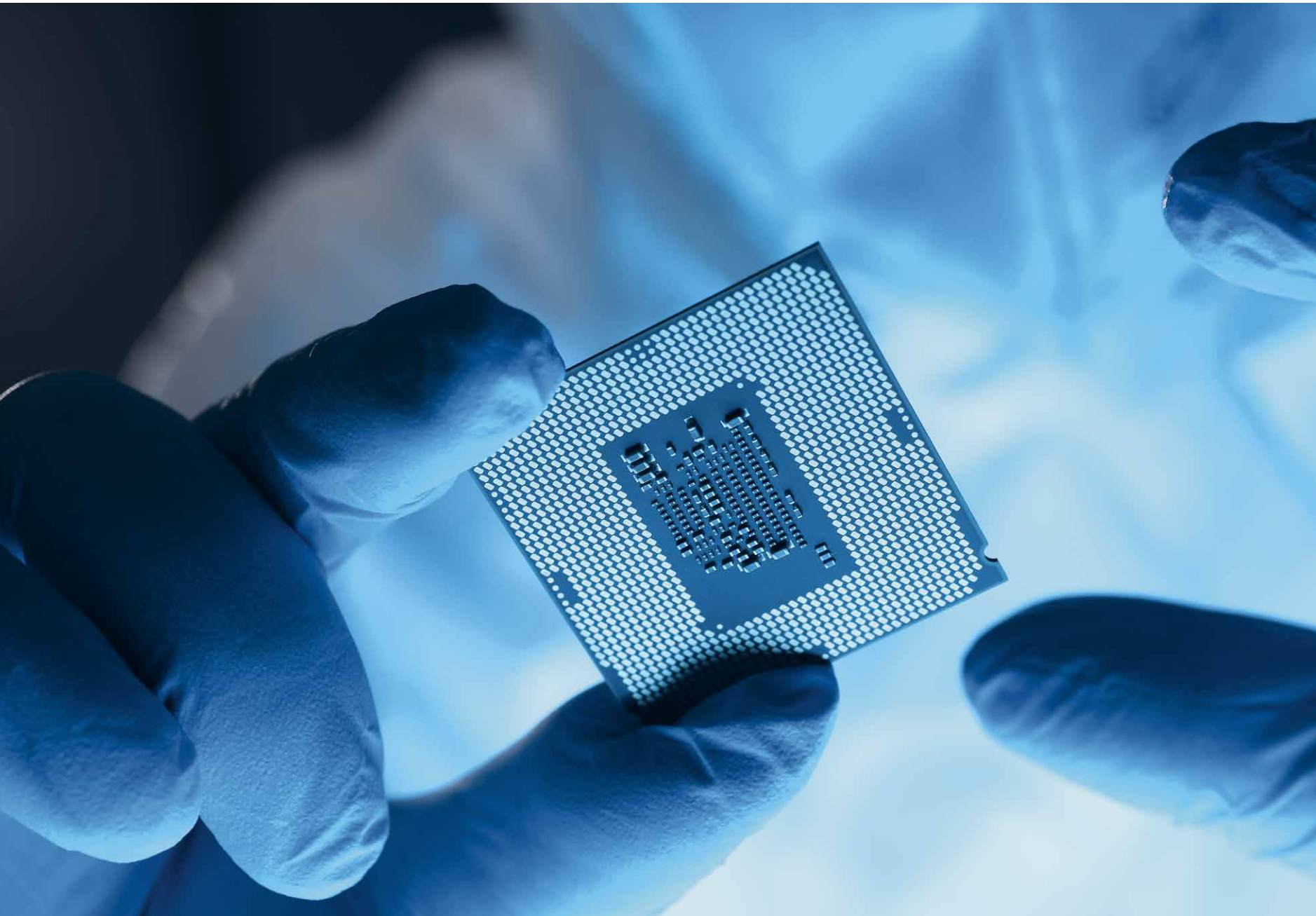
- Clean Rooms
- Measuring Rooms
- Semi-Clean Rooms
- Dry Rooms

Your matching Vindur Turnkey Components:

- Wall, ceiling and floor systems
- Climate and refrigeration technology
- Filter Fan Units (FFUs)
- Monitoring systems
- Personnel and material airlocks
- Workbenches and laminar flow units
- Crane systems

Microelectronics, semiconductors, photovoltaics.

Vindur Turnkey - high-purity process environments for sensitive electronic components.



Standards/laws/guidelines	Clean Room	Measuring Room	Process Climate System
Semi-standard	●		●
Machinery directive	●	●	●
Low-voltage directive	●	●	●
DIN EN ISO 14644	●	●	●

In IC production, the semiconductor industry needs high-purity process environments in order to avoid rejects and to be able to perform reliable measurements in the nano-metre range. With individually planned Vindur Turnkey Clean Room Installations, you can ensure process air free of particles and molecular contamination. Rely on the smart solutions from weissttechnik for quality assurance now and for years to come.

Long-standing experience.

We have been working with manufacturers in microelectronics for many years. Our **Vindur Turnkey** Systems for enclosing critical process environments, mini environments and our high-precision air-conditioning units ensure reproducible process parameters at all times. With our experience in developing special air-conditioning systems, you can always implement your design decisions according to international safety standards.

Customised development.

In the **weissttechnik** development centre, we can simulate a wide range of climatic conditions and thus also your room conditions. In this way, we qualify the climatic **Vindur Turnkey** Systems in a way as they will later be used by you. Sources of interference such as molecular contaminations in the process air, which lead to corrosion or degradation of optical systems or negatively affect process parameters, can thus be safely excluded.

Our solutions for the industry:

- Clean Rooms
- Measuring Rooms
- Process Climate Systems

Your matching Vindur Turnkey Components:

- Wall, ceiling and floor systems
- Climate and refrigeration technology
- Filter Fan Units (FFUs)
- Monitoring systems
- Personnel and material airlocks
- Workbenches and laminar flow units
- Clean room tents
- Mini environments

Food and beverages.

Vindur Turnkey - Clean Rooms for maximum food safety.



No matter, if in the production of baby food, in dairies or in the packaging of pasta squares: a hygienically clean climate is crucial for food safety. With Vindur Turnkey Clean Room and Process Climate Solutions individually tailored to your processes and foodstuffs, you can ensure a production environment as germ-free as possible. Take advantage of the expertise of weissttechnik.

Controlled hygienic climate.

In partnership, we have been implementing projects for many renowned companies in the food industry for many years. Our Vindur Turnkey Clean Room Solutions ensure a controlled hygienic climate wherever food and beverages are processed, refined, filled, packaged or stored. We help you to reduce the total bacterial count (TBC). For example, with air that is treated according to your needs. This way, you can also reduce the contamination of openly processed food. In view of the trend to preserve food without chemical preservatives by using natural processes, this will become a competitive advantage.

Our solutions for the industry:

- Clean Rooms
- Semi-Clean Rooms

Your matching Vindur Turnkey Components:

- Wall, ceiling and floor systems
- Climate and refrigeration technology
- Filter Fan Units (FFUs)
- Monitoring systems
- Personnel and material locks
- Workbenches and laminar flow units
- Housing

Standards/laws/guidelines	Clean Room	Semi-Clean Room
EC no. 178/2002	●	●
EC no. 852/2004	●	●
EC no. 853/2004	●	●
EC no. 2073/2005	●	●
DIN EN 1672-2:1997	●	●
DIN EN ISO 14159:2002	●	●

Precision that gets under your skin.

Turnkey Clean Room Technology for the production of highly sensitive ocular implants.

The production of implants for the human eye is a highly sensitive area. Even the smallest impurities can cause a great deal of damage: that's why production takes place exclusively under clean room conditions. All production processes require the highest precision and standards-compliant safety to ensure maximum protection against quality deviations and contamination.

In order to modernise the existing clean room technology and build up new production capacities, HumanOptics commissioned Weiss Klimatechnik with the planning, construction and qualification of a new clean room complex. All construction measures had to take place during ongoing production in strict compliance with the EU GMP directive.

High-quality requirements.

HumanOptics, which is based in Erlangen, Germany, is one of the innovation leaders and premium providers of ocular implants. The product range includes high-quality and mass-produced standard eye lenses as well as customised products for individual requirements in eye operations. In order to prevent damage to the products and protect patients, HumanOptics applies particularly strict quality requirements at every step of the process. This includes, in particular, production under GMP-compliant clean room conditions.

Modernisation during ongoing production.

In view of the positive market development, HumanOptics wanted to comprehensively modernise the production area

at the Sankt Augustin site and expand a total of 700 m² of GMP-compliant clean room area in accordance with Guidelines C and D. HumanOptics site manager Mario Sündermann explains: "We want to continue to grow and open up new markets. At the same time, we are aiming for a new level of quality with our production". One of the goals was to also obtain FDA certification for the US market. A particular challenge was the planning and implementation of all construction measures during ongoing production.

Experienced partner in medical technology.

The specialist Weiss Klimatechnik was commissioned with the planning, construction and qualification of the clean room. It was important to ensure that production continued undisturbed. In addition, two differently acting installation areas had to be taken into account. In order to enable this, a customised solution with separate split-design chiller, matching Filter Fan Units (FFUs) and special building automation was developed. The climate systems are designed as mixed air systems with outdoor and recirculated air components and thus ensure the air supply for the new production areas. This ensures that the room air conditions such as temperature, relative humidity, room pressure and clean room classification are maintained, taking into account the heat loads.

Monitoring system for critical parameters.

To ensure that the legal regulations, common industry standards and the customer-specific parameters are complied with at all times, the order also included monitoring. A GMP-compliant monitoring system was installed on the basis of the SIMPATI® software. This ensures that cleanliness classes, temperature, humidity and room pressure meet the legal quality requirements in production at all times.

Implementation, results and outlook.

The detailed planning was followed by the four-stage implementation within 10 months. After the demolition of the old premises came the construction of the new production rooms. The climate technology system was then installed and qualified by Weiss Klimatechnik. The continuous operation of the production was maintained at all times. Our new clean rooms are in operation 24 hours a day, 365 days a year. The air-conditioning system is dimensioned in such a way that an area initially used as a warehouse can easily be converted into a Class D clean room if required. This makes the new location particularly flexible and future-proof.

Site manager Mario Sündermann sums up the project: "Our intention was to work with a qualified partner who would be able to provide us with a turnkey solution from a single source and guarantee reliable after-sales service. Weiss Klimatechnik has implemented this brilliantly."

The special features of the Vindur Turnkey project for HumanOptics:

- Floor space: 700 m²
- Walk-in clean room cabin in accordance with EU GMP C and D quality class
- Dismantling of old rooms in production
- Continuous production during the construction phase
- Compact chiller in split version
- Outdoor air dehumidification via second cooling circuit in the climatic cabinet unit
- Monitoring system **SIMPATI monitor**
- GMP qualification (DQ/IQ/OQ)
- Complete MCRT and software development

Standards/laws/guidelines

- EU GMP Guideline for medicinal products for human and veterinary use
- FDA 21 CFR Part 11, Electronic Records; Electronic Signatures
- VDI 6022: air-conditioning, clean air quality
- DIN EN ISO 14644: clean rooms and associated room area



We measure ourselves by our service.

We think and act in a service-oriented partnership.



With our Service Department, we offer sustainable solutions for a long-term and safe unit operation.

Professional consulting.

Our experienced employees can support you on site and on the phone during every step of your project, from initial idea to after-sales service.

Maintenance and servicing.

We offer various Service Levels and guarantee response times depending on the location of up to 24 hours after the fault notification has been received. Our full maintenance Service offers additional security with fixed, easy to calculate costs.

Spare parts management.

Many replacement and wear parts are available directly from our warehouse. To improve operational reliability even more, selected replacement parts can also be stocked on site. We will be happy to advise you.

Instruction and training.

We carry out regular training sessions on the use, operation and software for our equipment. On request, we can also offer customer-specific workshops for you on site.

Vindur Cockpit.

Intelligent Service Tool for your safety.

Fast reaction.

When air-conditioning systems in critical infrastructures malfunction, action must be taken quickly. **Vindur Cockpit** is the most effective solution for this. Your installed units are in contact with our Service Centre via reliable, user-friendly remote-access services. All devices are programmed to communicate and transmit data at regular intervals or when an alarm is triggered. This enables us to react immediately to an incident. We determine the best course of action based on data and ensure a timely and professional intervention. Online or through the use of a Service Specialist on site.

Professional remote service.

During remote maintenance, our Service Technician monitors your devices and systems by means of an encrypted VPN tunnel. This direct access to the user interface of the controller allows our services to begin immediately from the desktop.

Effective maintenance operations.

Thanks to the extensive parametric data and measurements of the units, our experts can accurately isolate and diagnose any operating condition. In this way, we ensure that the technician is perfectly prepared for an immediate solution in the event of an assignment at your site.

Safe is safe.

When using **Vindur Cockpit** for the management of your climate solutions, the protection of your data is also a top priority for us. We ensure a secure connection and rely on reliable security measures and the highest IT security standards.



Everything under control.

With our software and control packages.

intelli.4 - our smart control for your optimum room climate.

Simply intuitive.

intelli.4 allows you to operate all functions conveniently and intuitively. Their control via app icons is easy and simple to learn. In addition, the simple menu navigation reduces the risk of operating errors.

Maximum operating flexibility.

Regardless of whether via the touch screen, a computer of the building management system (BMS), tablet or smartphone: all intelli.4 functionalities can be conveniently controlled via a web browser at any time and from any place with network access.



Our highlights:

- All unit and climate data via web visualisation
- Data transfer via BMS using a BACnet interface
- Communication between several units, including without BMS
- Freely programmable connection of on-site functions
- Convenient remote monitoring and maintenance

Monitoring systems - safe is safe.

The core task of a monitoring system is the safe observation and documentation of certain parameters and defined conditions. With intelligent software solutions, **weisstechnik** also offers a number of other advantages. This means that the flexible control and documentation software can also be used for existing devices and thus ensure uniform monitoring. It can also be adapted and expanded in many ways through various options.



Curious?

Learn more about weisstechnik.

We are among the most innovative and significant developers and manufacturers of systems in the field of Environmental Simulation, Heat Technology, Climate Technology and Pharmaceutical Technology. No matter which industry and whether basic components or specially designed complex solutions are required: **weisstechnik** meets the highest requirements so that you can excel in all applications.

Do not hesitate to get in touch with us. Or visit our homepage: www.weiss-technik.com



Well explained. Well understood.

This is how the **Vindur Turnkey** concept works - the key to perfect climate with innovative complete solutions.

Click here for the video:



Passionately innovative.

We work in partnership to support companies in research, development, production and quality assurance. With 22 companies in 15 countries at 40 locations.

weisstechnik

For a safe future.



Environmental Simulation

The first choice for engineers and researchers for innovative, safe environmental simulation facilities. In fast motion, our test systems can simulate all the influences in the world as well as for instance in space. In temperature, climate, corrosion, dust or combined stress tests. With a very high degree of reproducibility and precision.



Heat Technology

Experienced engineers and designers develop, plan and produce high-quality, reliable heat technology systems for a broad range of applications from heating and drying cabinets to microwave systems and industrial furnaces.



Air Solutions

As the leading provider of clean rooms, climate technology and air dehumidification, we consistently ensure optimal climatic conditions for people and machines. For industrial production processes, in hospitals, mobile operation tents or in the field of information and telecommunications technology. From project planning to implementation.



Pharmaceutical Technology

With decades of experience and know-how, we guarantee the most sophisticated clean air and containment solutions. Our comprehensive and innovative range of products includes barrier systems, laminar flow systems, safety workbenches, isolators, airlocks and stability test systems.

Weiss Klimatechnik GmbH

Greizer Straße 41-49
35447 Reiskirchen/Germany

T +49 6408 84-0

cleanroom@weiss-technik.com

www.weiss-technik.com



Passion for Climate.



Management System
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

www.tuv.com
ID 900000289



KT-CR-Vind-Turnkey-01.1E/Print/11 2021

Illustrations may contain options.
Subject to technical changes.

