mediclean®

Clean air systems in operating theatres

www.weiss-technik.com
Play it safe when it comes to clean air for operating theatres!

Do you want to optimally supply clean air to the operating theatre and reliably protect against particles and surgical smoke? This is where we can support you.

Clean air systems for optimum safety.

OT clean-air canopies must meet the highest requirements in order to optimally protect patients and staff. At the same time, they must work economically. That is why we are offering you tailor-made clean air systems with unidirectional flow from a single source. They meet all relevant national and international norms and standards, such as DIN 1946 T4, HTM 03-01 and SNIP.

Unidirectional flow.

Our OT clean-air canopies create a low-particle protective zone that reliably screens the wound area, the instrument table and the surgical staff from the environment. That reduces the bacterial burden in sensitive areas by up to 90%*. At the same time, it protects the surgical staff from surgical smoke.

*Results of the study "Reduction of Airborne Bacterial Burden in the OR by Installation of Unidirectional Displacement Airflow (UDF) Systems”.

Innovation and experience from a single source.

Innovative and proven.

We are your experienced partner for innovative, reliable and efficient clean air technology for operating theatres. Our systems are deployed in more than 9,000 operating theatres around the world. Our reliable solutions incorporate the latest scientific findings and meet all relevant legal requirements.

Versatile and tailor-made.

Our range includes clean-air canopies in the form of recirculating air canopies (ULA) and filter surface canopies (FFA). If required, they can be expanded with innovative options, e.g., an air curtain system, a continuous particle monitoring system and an extraction for surgical smoke gases.

From a single source.

We comprehensively support you from the initial design to installation up until the solution is taken into service. We are the only company in the world that is a single source provider of OT clean-air canopies, air-conditioning units, air-conditioning systems and services that are so optimally coordinated with each other.
The quality of clean air in operating theatres is an important factor in the success of a surgical procedure. Furthermore, it is crucial to protect patients and surgical staff from surgical smoke. Our clean air systems are suitable for the most varied structural conditions, hygiene requirements and surgical fields. For that reason, great attention is paid to the prevention of infection and work place safety.

**ULA OT circulating air canopy**

Recirculating air canopies are fully integrated in the suspended canopy and are also suitable for the redevelopment of existing installations.

**OFFA OT filter surface canopy**

Filter surface canopies are often the best solution if the air-conditioning units are situated in a neighbouring room.

**UWM wall-mounted recirculating-air module**

Wall-mounted recirculating-air modules are especially suitable for use in operating theatres without enough space for canopy-mounted recirculating-air modules.

**Wide range of options**

The versatile options expand the range with respect to the prevention of infection, work place safety, hygiene and comfort.

**Clean air system solutions for your operating theatre.**

You can optimally and economically reach your hygiene goals using clean air systems from weisstechnik.
ULA OT recirculating air canopy

Reliably protect patients and staff by integrating the complete system in the suspended canopy.

How it works

The optimised low-turbulence recirculating air canopy consists of an air outlet element, terminal airborne particle filters, a plenum with sound absorbers and recirculating-air modules. In order to guarantee maximum safety alongside optimum efficiency, the ULA mixes the return air and supply air in the recirculating-air module. For this purpose, the theatre air is sucked into the recirculating-air module and mixed with the supply air coming from the air-conditioning unit. The mixed air is transported to the plenum positioned above the filter. From there, it is conducted in its particle filtered state as clean air into the operating theatre and the preparation area, where it forms a protective zone.

Protective Zone

The protective zone is formed by way of unidirectional flow. It covers the total sterile environment for the surgical procedure. The sterile environment also includes the material and instrument table as well as the persons in sterile clothing. As a result, the patient, surgical staff, material and instruments are optimally protected against particles and airborne bacteria. The area of the protective zone is marked on the floor.

Diagram of a ULA system

mediclean® hygiene compact air-conditioning unit

- Fresh air ≥ 1200 m³/h
- Return air ≥ 1600 m³/h
- Supply air ≥ 2800 m³/h
- Exhaust air ≥ 2600 m³/h

Your benefits:

- Optimum energy consumption
- Reduction of the duct size coming from the air-conditioning unit
- Air flow rate adjustment possible independent of air-conditioning unit and duct system
- Mixing of return air and supply air in the recirculating-air module, i.e. outside of the canopy body and as a result there is no temperature difference
- For the redevelopment of existing installations
ULA OT recirculating air canopy

Thanks to the variable aluminium frame system you can optimally adapt the OT canopy to your structural conditions.

Dimensions and design

The size of the protective zone is determined by the surgeons and hygienists, and depends on functional requirements and supply requirements of the operating theatre. In our experience, a protective zone of at least 3 x 3 metres is recommended.

Specifications

- **Air outlet element:** Polyester cloth (Differential Flow or uniflow)
- **Airborne particle filter:** H14 (in accordance with DIN EN 1822)
- **Plenum:** Anodised aluminium or stainless steel
- **Recirculating-air module:** Anodised aluminium (Intake module including stainless steel microfabric and F7 filter (in accordance with DIN EN ISO 16890)

### Type code (example)

ULA.4 32/32/5/6

- **6** = Height of recirculating-air module (690 mm)
- **5** = Height of plenum (550 mm)
- **32** = Length of the clean-air canopy field on the side of the recirculating-air module (3185 mm)
- **32** = Length of the clean-air canopy field (3185 mm)
- **4** = Version number
- **ULA** = Type designation for OT circulating air canopy

### Table: Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Length A</th>
<th>Width B</th>
<th>Clean air volume DIN 1946 T4</th>
<th>Recirculating air content</th>
<th>Weight¹</th>
<th>Clean air volume HTM 01-01</th>
<th>Recirculating air content</th>
<th>Weight¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>26/26</td>
<td>2575</td>
<td>2575</td>
<td>m³/h</td>
<td>m³/h</td>
<td>kg</td>
<td>m³/h</td>
<td>m³/h</td>
<td>kg</td>
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<td>29/29</td>
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<td>17000</td>
<td>9000</td>
<td>890</td>
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</tbody>
</table>

¹ At 0.24 m/s outflow speed.
² At 0.38 m/s outflow speed.
³ With plenum height of 550 mm, recirculating-air module height 550 mm.
⁴ With plenum height of 550 mm, recirculating-air module height 690 mm.

Other sizes available on request.

Sizes 32/32, 35/32 and 35/35 4 parts, all other sizes 2 parts.

We reserve the right to make technical changes without prior notice.

Diagram of a ULA OT recirculating air canopy

**Diagram of a ULA OT recirculating air canopy**

- Splitting the recirculating-air module is possible

**Split the recirculating-air module**

**Diagram of a ULA OT recirculating air canopy**

**All sizes:**

<table>
<thead>
<tr>
<th>Plenum Height (H)</th>
<th>Recirculating-air module Height (H1)</th>
<th>Connection sleeve Width (C)</th>
<th>Connection sleeve Height (D)</th>
<th>Feedthrough for lamps (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
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<tr>
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<td>690</td>
<td>4</td>
<td>350 (390°)</td>
<td>270 (320°)</td>
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</tbody>
</table>

¹ With ULA.4 35/35.
We reserve the right to make technical changes without prior notice.
**FFA OT filter surface canopy**

The intelligent clean air solution when the air-conditioning unit is located in the adjoining room.

### How it works

The OT filter surface canopy is supplied with 100% air from the air-conditioning unit. This air is transported via the duct system to the plenum positioned above the filter. From there, it is conducted in its particle filtered state as clean air into the operating theatre and the preparation room, where it forms a protective zone.

### Protective Zone

The protective zone is created by way of a unidirectional flow. It covers the total sterile environment for the surgical procedure. The sterile environment also includes the material and instrument table as well as the persons in sterile clothing. As a result, the patient, surgical staff, material and instruments are optimally protected against airborne particles and bacteria. The area of the protective zone is marked on the floor.

### Your benefits:

- Mixture of supply air and recirculating air directly in the air-conditioning unit
- Easily accessible gauging heads for inflow and measurement of the test aerosol
- Suitable for low suspended canopy heights
Clean air
Supply air
BB
CC
CC
EE
AA
DD
HH
Clean air
Supply air

Great versatility means that individual adaptations to structural conditions are always possible.

Diagram of an FFA OT filter surface canopy

Dimensions and design

The size of the protective zone is determined by the surgeons and hygienists, and depends on functional requirements and supply requirements of the operating theatre. In our experience, a protective zone of at least 3 x 3 metres is recommended.

Specifications

- Air outlet element: Polyester cloth (Differential flow or uniflow)
- Airborne particle filter: H14 (in accordance with DIN EN 1822)
- Plenum: Anodised aluminium or stainless steel

All sizes:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length A</th>
<th>Width B</th>
<th>Clean air volume DIN 1946 T4</th>
<th>Connection sleeve width C (300 mm)</th>
<th>Clean air volume HTM 03-01</th>
<th>Connection sleeve width C (450 mm)</th>
<th>Connection sleeve width C (550 mm)</th>
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<table>
<thead>
<tr>
<th>Height (H)</th>
<th>Connection sleeve Height (D)</th>
<th>Feedthrough for lamps (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
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</table>

We reserve the right to make technical changes without prior notice.

<table>
<thead>
<tr>
<th>Type code (example) FFA.4 26/26/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFA = Type designation for filter surface canopy</td>
</tr>
<tr>
<td>4 = Height of plenum (450 mm)</td>
</tr>
<tr>
<td>26 = Length of the clean air canopy field (2575 mm)</td>
</tr>
</tbody>
</table>

From size 20/20 2 parts, from size 32/32 4 parts.
Other sizes available on request.
We reserve the right to make technical changes without prior notice.
FFA system with UWM wall-mounted recirculating-air module

The ideal alternative when there is not enough space in the suspended canopy.

How it works

The wall-mounted recirculating-air module can either be installed in front of the wall, as an integrated component of a lightweight construction wall, or in an adjoining room. The recirculating air is sucked out of the operating theatre through the fluff separator directly on the wall-mounted recirculating-air module. Then it is filtered and conducted through the sound absorber with optional cooling. After that, the recirculating air from the fan is conducted with the supply air from the air-conditioning unit into the plenum of filter surface canopy that is positioned above the filter.

Your benefits:

- Reduced sound pressure level when installed in adjoining room
- Service and maintenance can be performed outside the operating theatre
- Easily accessible fluff separator designed for machine cleaning
- Use of a dry cooler is possible as an option

Diagram of a FFA system in combination with a UWM system
UWM wall-mounted recirculating-air module

You can choose whether to use it in combination with FFA OT filter surface canopy or on its own.

Specifications

- **Housing:** Stainless steel with glass fibre fabric inside
- **Fan module:** Two fans with a motor (double shaft) including backflow prevention dampers
- **Sound absorber/cooling module:** Height is variable according to the clear room height
- **Dry cooler:** Optional: tube/lamella/frame: Cu/Al stainless steel
- **Recirculating air-intake/filter module:** Stainless steel microfibre suitable for washing machines (fluff separator), filter in F7 filter class in accordance with DIN EN ISO 16890

### External dimensions

<table>
<thead>
<tr>
<th>Full module</th>
<th>Recirculating air-intake/filter module</th>
<th>Sound absorber/cooling module</th>
<th>Fan module</th>
<th>Blind on the base</th>
<th>Weigh of full module</th>
</tr>
</thead>
<tbody>
<tr>
<td>W x H x D mm</td>
<td>W x H x D mm</td>
<td>W x H x D mm</td>
<td>W x H x D mm</td>
<td>W x H x D mm</td>
<td>kg</td>
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<tr>
<td>1100 x 3450 x 450</td>
<td>1100 x 1300 x 450</td>
<td>1100 x 1580 x 450</td>
<td>1100 x 500 x 450</td>
<td>1100 x 70 x 450</td>
<td>approx. 280</td>
</tr>
</tbody>
</table>

*Height of sound absorber module-variable (in accordance with the clear room height).
Customised solutions available on request.
We reserve the right to make technical changes without prior notice.

### Dry cooler

<table>
<thead>
<tr>
<th>Recirculating air volume flow¹</th>
<th>Cooling output, sensitive</th>
<th>Medium</th>
<th>Temperature medium supply/return</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>m³/h</td>
<td>kW</td>
<td>°C</td>
<td>Pa</td>
<td>kg</td>
</tr>
<tr>
<td>3000</td>
<td>3.3</td>
<td>Water</td>
<td>14/16</td>
<td>approx. 15</td>
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</tbody>
</table>

*Higher recirculating air volume flows available on request.
We reserve the right to make technical changes without prior notice.

### Fan

<table>
<thead>
<tr>
<th>Recirculating air volume flow¹</th>
<th>Current consumption</th>
<th>Input power</th>
<th>Power supply connection</th>
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</thead>
<tbody>
<tr>
<td>m³/h</td>
<td>A</td>
<td>kW</td>
<td>VAC/Hz</td>
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<tr>
<td>1100–3000</td>
<td>4.1–5.2</td>
<td>0.7–0.91</td>
<td>230/50</td>
</tr>
</tbody>
</table>

*Higher recirculating air volume flows available on request.
We reserve the right to make technical changes without prior notice.
CPM continuous particle monitoring

Count on the world’s first real-time monitoring system for airborne particles and bacterial burden in the operating theatre.

Application area

The CPM system meets the increasing hygiene requirements in the operating theatre and helps to effectively protect patients from airborne particles and bacterial burden. Controlling the air quality can provide an important aid in avoiding nosocomial infections through contaminated surgical instruments. In this way, it serves to ensure quality. Furthermore, it allows the exact documentation of the clean air quality.

How it works

The air is sucked in through a vacuum pump via a tube right in the critical area above the surgical instruments or the instrument table, and the air is conducted through a particle counter that continually measures the air quality. If the air pollution increases, e.g. through the vigorous movement of the surgical staff, then the clean air supply is also automatically increased for the period of the increased burden. A screen or a light shows the current status of the air quality at all times.

Application area

The CPM system meets the increasing hygiene requirements in the operating theatre and helps to effectively protect patients from airborne particles and bacterial burden. Controlling the air quality can provide an important aid in avoiding nosocomial infections through contaminated surgical instruments. In this way, it serves to ensure quality. Furthermore, it allows the exact documentation of the clean air quality.

How it works

The air is sucked in through a vacuum pump via a tube right in the critical area above the surgical instruments or the instrument table, and the air is conducted through a particle counter that continually measures the air quality. If the air pollution increases, e.g. through the vigorous movement of the surgical staff, then the clean air supply is also automatically increased for the period of the increased burden. A screen or a light shows the current status of the air quality at all times.

Your benefits:

- Prevention of infection through the continual monitoring of the air quality
- Light-screen display to show the current air quality
- Increasing awareness among the surgical staff and protection of the sterile chain
- Clean air supply adapted to suit requirements
- Quality management possible for every operation thanks to documentation

Diagram of a continuous particle monitoring system: CPM system in combination with a ULA system
SSV surgical smoke extraction

With the SSV surgical smoke extraction you can reliably protect the surgical team against dangerous smoke and always ensure a clear view.

Application area
Increasingly often high frequency, radio frequency, laser and ultrasound instruments, which lead to the formation of surgical smoke, are used in modern surgery. The harmful smoke gases and aerosols rise upward and the surgical staff inhales them. Surgical masks and mobile extraction devices have proven to be less practical in this regard. The surgical smoke extraction sucks smoke from where it is formed: right on the wound. In doing so, the extraction tube can be positioned by the surgeon so that an optimum extraction effect with a clear view can be achieved.

How it works
The extracted air is conducted upwards via a tube and is transported though a vacuum pump or a fan directly to the exhaust air. The process significantly reduces smoke particles and unpleasant odors. Furthermore, regular filter changes are not necessary unlike with mobile devices. The placement of the pump or fan outside of the operating theatre avoids noise pollution. In combination with an unidirectional flow canopy, the innovative smoke extraction offers the best efficiency and therefore optimum protection in addition to comfortable working conditions for the surgical staff. Alternatively, the extraction can be coupled to the surgical instrument and can be automatically switched on and off.

Your benefits:
- Optimum protection of workers against surgical smoke, aerosols, nanoparticles and other hazardous substances
- Clear view thanks to direct extraction and possibility to work independently without additional staff
- Low noise level thanks to the connection to the exhaust air (no recirculating air)
- No noise generation since the pump is outside the operating theatre
- Easy to maintain, no filter change necessary

Diagram of an SSV system in combination with an FFA system
GSS glass flow stabiliser

Enlarge the protective zone in the operating theatre.

How it works

The permanently installed flow stabiliser is made of high quality compound safety glass. It enlarges the protective zone by preventing the constriction of the laminar air flow under the outlet. As a result, the penetration of airborne particles and bacterial burden from outside into the protective zone is prevented in the area of the glass pane.

The longer the glass pane is, the bigger the protective zone is. When planning, it must be ensured that no collision risk with medical installations, e.g. canopy-mounted supply units, arises.

ACS air curtain system

The innovative alternative to increase the size of a protective zone.

Application area

The air curtain system is an innovative flow stabiliser - complementate and screenless. It is ideally suited for operating theatres, in which there is an increased risk of collision when using a stationary glass flow stabiliser due to a multitude of medical installations (e.g. operation lamps, mobile angiographic units or canopy-mounted supply units).

How it works

In the air curtain systems, the air flow is stabilised by air instead of a glass pane. The air is guided via the frame profile and duct tracks that are integrated around in the frame profile. The air volume can be regulated very easily.
OPAS operating theatre air extraction system

For pumping extract air out of the operating theatre.

FA fluff separator

Simply makes the duct system fluff free.

Application area

The OPAS operating theatre air extraction system is available as a wall or corner design. Symmetrical extraction in all four corners of the room is recommended. The extraction chamber is either visibly positioned in front of the wall in the corner or is integrated into a lightweight construction wall. An inspection door with sash fastener allows for easy access and simple cleaning. The FA fluff separators, optionally with volume setting, are located in the extract air openings that are positioned near the floor and canopy.

How it works

The fluff separator is available with or without a volume setting and is designed to be installed in the extract air openings in the operating theatre. It ensures that the duct system and the downstream system components remain free from fluff. The fluff separators are made of a close meshed stainless steel wire mesh that is affixed in a stable, self-supporting and corrosion resistant stainless steel frame. The extract air is regulated by an air volume setting using counter rotating lamella or hit and miss dampers. The fluff separator can be easily removed without tools and is suitable for machine cleaning.

Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>Front side (mm)</th>
<th>Leg length (mm)</th>
<th>Max. extract air volume (m³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORNER DESIGN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPAS-E 500</td>
<td>approx. 700</td>
<td>500</td>
<td>1500</td>
</tr>
<tr>
<td>OPAS-E 700</td>
<td>approx. 1000</td>
<td>700</td>
<td>3000</td>
</tr>
<tr>
<td>WALL DESIGN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPAS-W 500/250</td>
<td>500</td>
<td>250</td>
<td>1500</td>
</tr>
<tr>
<td>OPAS-W 700/350</td>
<td>700</td>
<td>350</td>
<td>3000</td>
</tr>
</tbody>
</table>

Other sizes available on request.
We reserve the right to make technical changes without prior notice.
LED theatre lighting

To optimally light the operation area.

Specifications

The LED theatre lighting is positioned circumferentially and directly on theatre room canopy (FFA/ULA) and is integrated in the aluminium frame system. The anti-glare LEDS have 4,000 K colour temperature, are neutral white, with RA > 90, and meet protection class 1, as well as the IP65 type of protection. The specular louvers can be swivelled by ±30°. The lighting cover is made of compound safety glass and is resistant to disinfectant and UV radiation.

IF infrared heating panel

The innovative alternative to conventional wall heating.

How it works

If heat loads are lacking, the infrared heat panels ensure that a temperature difference of ≥ 0.5 K between supply air and extract air temperature is generated. The innovative canopy heating generates a pleasant radiant heat with a short reaction time, which emits heat directly to solid bodies. In doing so, the air is not heated, thus preventing dust turbulence. The infrared heat panels are easy to install or upgrade, and have smooth surfaces that are easy to clean and disinfect.

Lamps

<table>
<thead>
<tr>
<th>Lamps</th>
<th>Short design</th>
<th>Long design</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>External dimensions W x D x H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>2 rows</td>
<td>1250 x 460 x 90</td>
<td>1550 x 460 x 90</td>
</tr>
<tr>
<td>3 rows</td>
<td>1250 x 350 x 90</td>
<td>1550 x 350 x 90</td>
</tr>
</tbody>
</table>

IF infrared heating panel

<table>
<thead>
<tr>
<th>Type</th>
<th>Heat output</th>
<th>Type</th>
<th>Heat output</th>
<th>External dimensions W x D x H without installation frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF 60/60</td>
<td>550</td>
<td>IFHP 60/60</td>
<td>650</td>
<td>593 x 593 x 36</td>
</tr>
<tr>
<td>IF 120/60</td>
<td>1100</td>
<td>IFHP 120/60</td>
<td>1300</td>
<td>1193 x 593 x 36</td>
</tr>
<tr>
<td>IF 120/30</td>
<td>550</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We reserve the right to make technical changes without prior notice.
Top off your clean air system with additional options.

Our versatile range leaves nothing to be desired - everything from a single source.

MVB media supply bridge
Customer specific connections for high and low voltage current, medical gases, communication, and data technology are integrated in the medical supply system. When the media supply bridge is used, an air guide skirt is automatically in place this prevents the penetration of airborne particles and bacteria from the outside into the protective zone in the area of the glass skirt. As well as the rectangular standard design, U, L and I shaped designs are also available. Upgrades are possible at any time.

MediClean hygiene compact air-conditioning unit
The MediClean hygiene compact air-conditioning units are particularly space-saving and are ideally suited to being integrated in existing buildings. In doing so, depending on requirements they can be placed as a single module or several module compact unit in central air-conditioning system or in an adjoining room. All control technology is already integrated in the system and an additional control cabinet is generally not needed.

Fabric outlet in designer look
The attractively printed cover fabric pleasantly enhances the most sterile operating theatre atmosphere. Above all, for operations using spinal anaesthesia or local anaesthetic, it also helps calm the patient. The design can be selected according to the customer’s wishes.

intelli.4® control system
The proven intelli.4® control system is deployed in all weisstechnik air-conditioning units. The controller with an open structure has a modular design and is suitable for all current and future controller generations. intelli.4® can be flexibly networked and has a wide range of different interfaces, including an interface to the building control technology. It can easily be expanded at any time in almost any way.
We measure ourselves by our service!

Our services – lots of good arguments:

• Global service network
• Wide range of preventive maintenance services
• Secure spare parts supply
• Special service operations available at all times
• Proper disposal of your old units with verification

A weiss technik specialist is always close by.

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We are happy to present selected case studies on this subject to you.

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**Heating technology**

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

**Air-conditioning technology, air dehumidification, cleanrooms**

As the leading provider of cleanrooms, air-conditioning technology and air dehumidification, we consistently ensure optimal ambient conditions for people and machines. For industrial production processes, in hospitals, mobile operating tents or in the field of information and telecommunications technology. From project planning to implementation.

**Clean air and containment systems**

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 and airlock gate systems.