



CUSTOMISABLE AIR HANDLING UNITS & FULL AIR CONDITIONERS

Blue Line



ABOUT US

Since 1961, HANSA Klimasysteme GmbH has had its headquarters in Strücklingen in the municipality of Saterland – which, with its Saterland Frisian dialect, is recognised as the smallest language enclave in Germany. However, we speak plainly through our products.

Our company

Since the company was established, we have earned a positive reputation throughout Germany and far beyond for the construction of air handling equipment for schools, sports halls, swimming pools, hospitals and industrial and process engineering applications. On this basis, we offer a broad range of different air conditioning units for a wide variety of applications.

We guarantee a maximum level of quality, functionality and reliability, as well as excellent energy efficiency. Throughout the

We have been the guarantee for high-quality, technically sophisticated air conditioning systems for many decades. Our company is distinguished by continuity and stability, with the Neumann family having managed the enterprise since 1971.

course of our development work, numerous property rights have been registered with the European Patent Office, where they were found to be patentable and worthy of protection.

As a member of RLT Herstellerverband e.V., the AHU manufacturers' association, we design our units to comply with AHU directives, ensuring that our customers and the operators of our systems enjoy quality, operational reliability and legal certainty at all times.

Our team

We continuously train our employees and young talent in order to safeguard our future. The HANSA team consists of experienced skilled professionals in the areas of air handling equipment manufacturing and the associated specialised divisions for refrigeration technology and control technology and systems.

Design and production are executed under QM conditions and in accordance with DIN EN ISO 9001:2015.

Our sales team consists of experts who are certain to plan and develop the ideal solution for you.

Our philosophy

Our goal is to fulfil our customer's wishes in an optimum manner and, also, contribute to the protection of the environment. We provide systems for this purpose which, thanks to flexible production processes and modern components, can be adapted to the individual operating conditions at customers while simultaneously consuming as little energy as

possible. Investment and energy costs also fall, as the energy needs of the entire system and individual modules can be reduced without impairing the performance of the system.

We have been a climate-neutral company since 2020, and the manufacture of our products is also climate-neutral.

Committed to the climate – and not only through our equipment



HANSA is a member of the Herstellerverband Raumlufotechnische Geräte e.V. association for AHU manufacturers

BLUE LINE

Overview

Blue Line represents highly customisable air handling and full air conditioning units with maximum energy efficiency in the familiar high HANSA quality. These units are configured according to

customer requirements in compliance with applicable standards and directives and are optimised for the respective application.





Blue Line HKG are our highly flexible all-round units that feature a highly efficient heat recovery system – and they can also be used as hygiene units or for data centre cooling. Nothing is impossible!

You've got the task, and we have the solution. We can integrate every available component and necessary characteristic for air handling into these units, including the following:

Heat recovery:

- Counterflow heat exchanger
- Cross-flow plate exchanger
- Double plate exchanger
- Rotor
- Accubloc
- Closed loop system

Control:

- Control cabinet with HEC control
- Control cabinet with Saia DDC
- Control cabinet with Siemens DDC

Refrigeration system:

- Adiabatic spray humidification
- Integrated refrigeration system
- Integrated heat pump

Characteristics:

- ATEX compliant design
- Hygienic design
- Weatherproof

Humidification:

- Honeycomb humidifier
- Steam humidifier
- Direct humidifier



ENERGY EFFICIENCY

Efficiency classes

As a member of RLT Herstellerverband E e.V., the AHU manufacturers' association, we indicate the energy efficiency of all units with heat recovery through the A+, A and B label. The assignment of class occurs on the basis of two parameters:

- Air velocity
- Observance of EU Regulation 1253/2014

Please refer to the adjacent table for the exact classification.



Air velocity class [m/s]

V1	≤ 1.6
V2	> 1.6 to 1.8
V3	> 1.8 to 2.0
V4	> 2.0 to 2.2
V5	> 2.2 to 2.5
V6	> 2.5 to 2.8
V7	> 2.8

Table:
Air velocity classes

Directive 2009/125/EU

The European Ecodesign Directive 2009/125/EU defines the minimum requirements to be met by products that are relevant in terms of energy consumption (ErP, energy-related products). The objective of this directive is to reduce CO₂

emissions and increase the proportion of renewable energy in the energy mix. The directive only applies in the European Economic Area and Turkey. Export products for non-EU states remain unaffected.

Criteria

Efficiency classes:



Please refer to RLT Directive "Certification" from the manufacturers' association for the exact criteria.

Velocity classes for units:

- Without air treatment V5 V6
 - With air heating V4 V5
 - With other features V2 V3
- ErP2018

Temperature transfer rate η_t of heat recovery:

- Closed loop system 0.68
- Rotor/Plate exchanger 0.73

Eurovent

Our units in the HKG range (HKG modular design) have also been Eurovent-certified since September 2020.



AirCalc



Our air handling and air conditioning units are designed completely in our AirCalc design program. This software enables the achievement of tailored solutions without the restriction of rigidly predefined unit types. AirCalc is certified by the TÜV Süd technical inspection association and Eurovent.



The headquarters of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection in Berlin is a passive house project, ventilated by HANSA Accu units with highly efficient heat and moisture recovery.

STANDARDS & DIRECTIVES

Certified quality

In addition to European directives (e.g. the Machinery Directive, Electromagnetic Compatibility Directive, Low Voltage Directive, ATEX) and general principles for the design and construction of air handling units, standards specific to applications must be observed during de-

sign and production. We have been manufacturing air handling equipment for 50 years for use in areas such as rooms used by people and in hospitals, swimming pools, server rooms, kitchens and points of sale for food.

Carbon neutrality

We calculated the CO₂ footprint of both our company and our products in 2020.

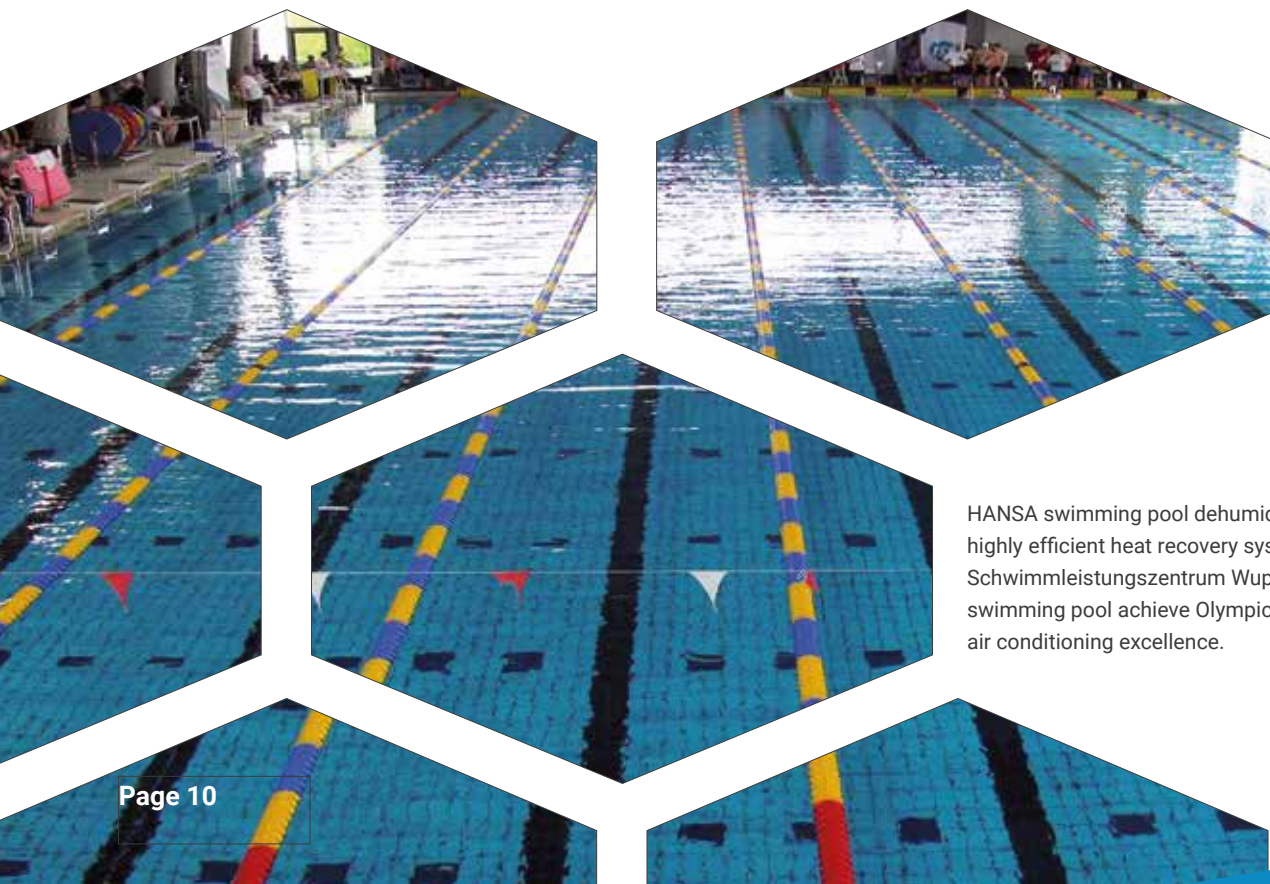
Based on this, we are the first company in our sector to compensate for our CO₂ emissions in accordance with the Clean Development Mechanism. As a result, we are now a carbon-neutral company that provides carbon-neutral products. HANSA is also a member of the Development and Climate Alliance.



Inspections

In addition to independent design and production in conformance with standards, our units are regularly inspected by independent inspection bodies to ensure their compliance with all relevant standards. Comprehensive expertise has grown from this, guaranteeing that you enjoy the commercial and technical security you require. This also involves legal security and the flawless operation of our systems for their intended use.

- We use design software and components certified by the TÜV Süd technical inspection association to provide our customers with ecologically and economically optimised solutions whose classification in AHU energy efficiency classes ensures they can be compared at all times
- Test reports confirm compliance with applicable standards
- Our units in the HKG range are certified by Eurovent
- Our QM system encompasses all company processes and demonstrates to our customers that we are a reliable partner in an economic and technical sense



HANSA swimming pool dehumidifiers with highly efficient heat recovery systems in the Schwimmleistungszentrum Wuppertal public swimming pool achieve Olympic standards of air conditioning excellence.

Hygiene units

Based on our many years of experience in the hospital sector, we can provide optimum equipment through our **Blue Line Hy** systems:

- Assemblies are arranged for easy cleaning and disinfection, and this is confirmed through appropriate certificates
- Maintenance-friendly layout of the refrigeration systems and humidifiers outside hygiene areas
- Storage and logging of operating data in accordance with applicable documentation requirements
- Remote management via our DDC management systems
- Certificates confirm compliance with standards such as VDI 6022, ÖNORM H 6021, VDI 3803, DIN EN 13779, DIN 1946-4, SWKI 99-3, ÖNORM H 6020

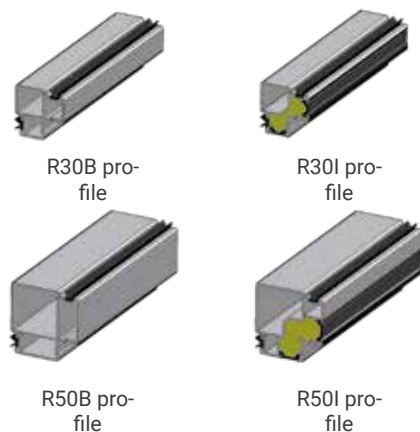


HOUSINGS & PRODUCTION STANDARDS

Profiles

Depending on the unit size and customer requirements, we use 30 or 50 mm frame profiles made of aluminium (R30 and R50 profiles), anodised where necessary. Each cube of these profiles can also be thermally broken and insulated (R30I and

R50I) where necessary. These profiles are distinguished by effective thermal insulation and the avoidance of thermal bridges. Energy wastage and condensation problems are avoided as a result.



Double lip EPDM rubber seals are fitted in all profiles. These are distinguished by the following features:

- Resistance to ageing
- Resistance to alkalis and acids
- Resistance to disinfectants
- Suitable for hot disinfection
- Suction and pressure side sealing

Panels

Planking elements are manufactured as double-shell constructions from galvanised and, additionally, coated steel. The seam technique employed and installation avoid sharp edges. We use mineral

wool (A1 fireproofing) for thermal insulation. In addition to fixed elements, removable panels and / or panel doors are fitted that are closed with claws or sash locks.

Options:

- Different colours
- Corrosion protection class C5-H
- Realised in stainless steel or aluminium

Security measures:

- Claws with anti-rotation and captive screw
- Sash lock
- Double-lever sash lock on pressure side

Our own powder coating plant enables us to address the most varied customer wishes and requirements.



Powder coating

Our own powder coating plant enables us to address the most varied customer wishes regarding colouring or corrosion

protection classes. We can also apply an antibacterial coating with our system.

Tested quality

It goes without saying that HANSA housings comply with relevant directives and standards (e.g. Machinery Directive, ATEX Directive where appropriate, DIN EN 1886, etc.). Flawless design and realisation are substantiated by numerous expert appraisals in this context.

Technical data: *

Heat transfer coefficient	T2
Thermal bridging factor	TB1
Deflection	D2 (M)
Tightness class at 700 Pa	L1(M)
Appropriate filter classes	G1-F9


* Housing with R50I-C profiles and thermally broken panels with mineral wool insulation.

Test basis DIN EN 1886 (07/2009)

TESTREPORT

PRÜFBERICHT

No./Nr. MB 933



<p>Test laboratory Prüfstelle</p> <p>Subject of test Prüfgegenstand</p> <p>Customer Auftraggeber</p> <p>Scope of order Auftragsumfang</p> <p>Date of delivery Eingangsdatum des Prüfgegenstandes</p> <p>Period of test Zeitraum der Prüfung</p> <p>Place of test Prüfört</p> <p>Experts Sachverständige</p> <p>Standard of test Prüfgrundlage</p>	<p>TÜV SÜD Industrie Service GmbH Center of Competence for Refrigeration and Air-Conditioning Dept. for Air-Conditioning and Ventilation</p> <p>Model box / Musterbox Manufacturer / Hersteller: Hansa Ventilatoren- und Maschinenbau Neumann GmbH HKG-1213</p> <p>Range name / Baureihe: - Order No. / Auftrags Nr.: - Test / Test: -</p> <p>Hansa Ventilatoren- und Maschinenbau Neumann GmbH Stockweg 19 D-26683 Saterland</p> <p>Test according to DIN EN 1886 (07/2009) Prüfung nach DIN EN 1886 (07/2009)</p> <p>2017-07-20</p> <p>2017-07-26 - 2017-08-01</p> <p>Olicing Olicing Igor Gagula Sebastian Rieger Finn Schülke</p> <p>DIN EN 1886 (07/2009)</p>	<p>Date: 2017-08-03</p> <p>Our reference: 61364042Cp</p> <p>Document: 93388 Hansa Klima report V8.48.004</p> <p>Order No.: 2184266</p> <p>The document consists of 12 pages. Page 1 of 12</p> <p>Excerpts from this document may only be reproduced and used for advertising purposes with the express written approval of TÜV SÜD Industrie Service GmbH.</p> <p>The test results refer exclusively to the units under test.</p> <p>Die unabhängigen Prüfberichte, die Dokumenten und die Verwendung zu Werbezwecken bedürfen der schriftlichen Genehmigung der TÜV SÜD Industrie Service GmbH.</p> <p>Die Prüfberichte beziehen sich ausschließlich auf die untersuchten Prüfgegenstände.</p>
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COMPONENTS - FANS

Design types



EC fan module (ebm-papst), standard design with spider (vibration-decoupled mounting on the pressure bulkhead).

The choice of a suitable design depends initially on the operating conditions. The following must be taken into consideration:

- The air volume to be supplied
- The pressure to be built up
- Spatial conditions within the unit

Fans used today primarily have exposed impellers and blades curved backwards. They are distinguished by a high level of efficiency and the generation of high pressure levels. They can also be arranged on the suction or pressure side relative to the components fitted, as they exhibit lower dynamic pressure in the output area. All considered, this facilitates the flexible design of more energy efficient and quieter AHU units.

Motors

Direct impeller drive has largely replaced the belt drive today, extending the service life of motors and reducing soiling in the unit due to abrasion. Speed control is typically achieved through a frequency converter in the case of three-phase motors or a control signal in the case of DC motors (EC motors). The speed in both

cases can be specified by the control to suit requirements.

DC motors with capacities of up to approx. 11 kW are used. The benefits of greater efficiency are very evident here, and the external rotor mechanism is unproblematic.



Pull-out fan module
(Ziehl-Abegg) in coated design.

Design

Certifications

Fundamentally speaking, fans do not perform functions associated with safety concerns, unless they are explicitly designed and certified for this purpose.

- The maximum permissible temperature of the air conveyed is typically 40°C. Special designs permit higher temperatures and are, consequently, suitable for smoke extraction.
- ATEX-compliant units explicitly require appropriately certified, explosion-protected fan modules.

Material

Fan modules can be manufactured with different materials and coatings that can influence their service lifespan considerably. Corrosion aggressive atmospheres,

such as are encountered in swimming pools, can lead to imbalances and, in the worst case, the blades breaking off.



Smaller pull-out fan module (Ziehl-Abegg).

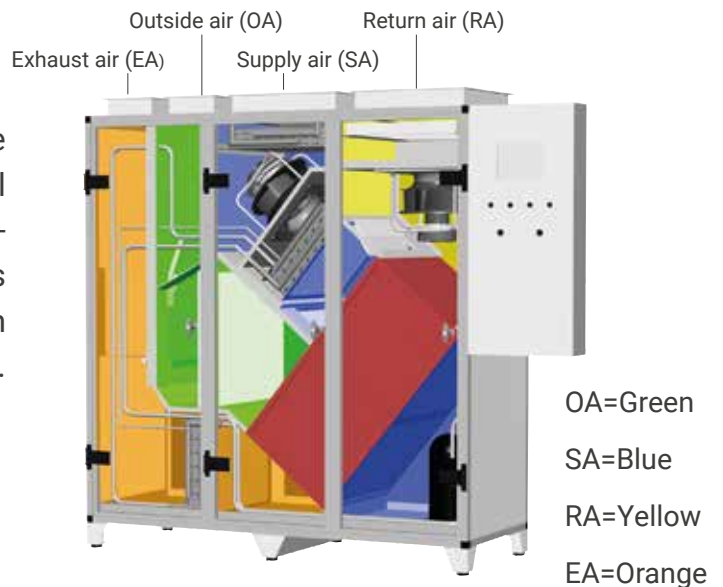
Installation situation

Smaller fan modules and the vibration decoupling are mounted completely on the pressure bulkhead (see image on page 14). This facilitates the required cleaning work and considerably reduces costs. Medium-sized modules are designed as a pull-out unit (see image on page 15). The vibration-decoupled module is mounted here on a rigid rail. Very large modules are mounted on a fixed steel profile with vibration dampening.



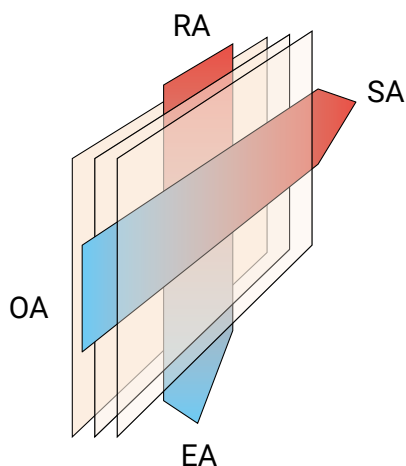
COMPONENTS - HEAT RECOVERY

The heat recovery system is a core component of our Blue Line units. All available and common heat recovery systems can be integrated, thus ensuring that our units operate with the highest level of energy efficiency.



Cross-flow heat exchanger, double plate exchanger design (red) in KL-P-iK compact air conditioning unit. The air types in the unit are each marked with standard colours.

Plate heat exchanger

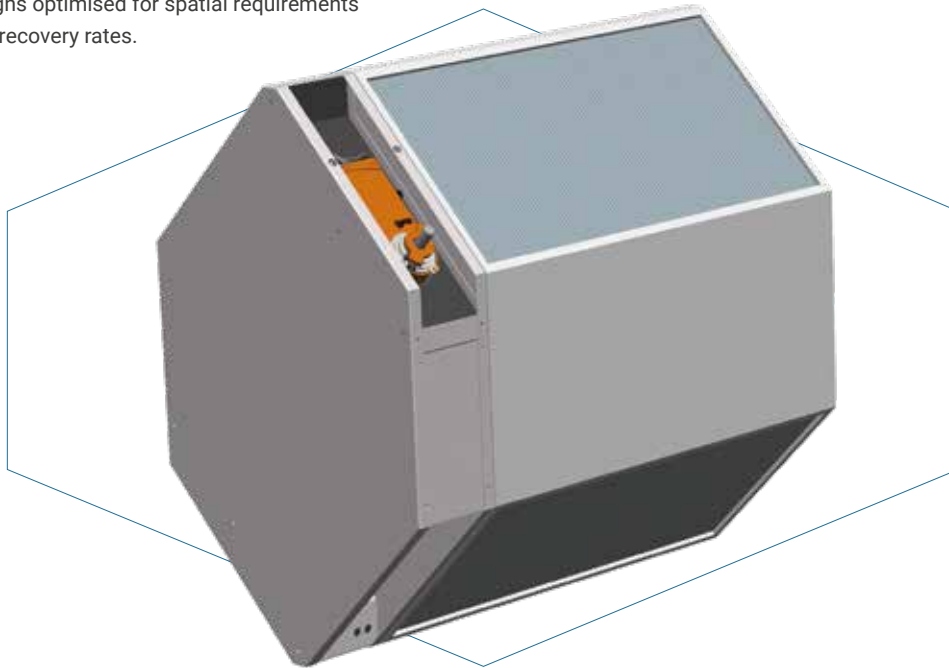


The exhaust air / discharged air and outdoor air / supply air streams are guided separately past each other through layers in a plate heat exchanger (cross flow in this case).

Recuperators are typically designed as cross-flow or cross-counterflow heat exchangers and realised as plate heat exchangers (PT) or double plate heat exchangers (DPT).

As static systems, these recuperators are particularly unproblematic under design conditions. In addition, they usually provide adequate separation of the air streams.

Counterflow heat exchanger with bypass damper. This construction facilitates the achievement of unit designs optimised for spatial requirements and high recovery rates.



Depending on requirements, we install plate heat exchangers with enhanced corrosion protection or coatings (e.g. for applications involving adiabatic cooling through spray humidification). Counterflow heat exchangers are also

available (see image above). These types are distinguished by a high level of heat recovery and a low space requirement. Plate exchangers that are regenerators with moisture-permeable materials are a special form.

Rotor

The rotor is a regenerative heat exchanger with excellent heat and moisture recovery rates (the latter through a hygroscopic coating or through condensation). Ideal conditions are achieved in the case of high air capacities and air free of toxic pollutants. Rotors are fitted in our successful Blue Line eco-R unit series that covers a broad range of pipeline classes and are delivered ready for connection with a control system.



Rotors are primarily used for high air capacities. They are assembled in the case of large air volumes for the factory test run and then dismantled again for transportation.

Accubloc

Compact air conditioning units with highly efficient regenerative heat recovery can be realised with the Accubloc (see image at top right). Two separate accumulators remove energy and moisture from the exhaust air line and transfer it to the supply air line. A particularly rapid damper actuator ensures the minimisation of air leakage.



The Accubloc system works with two accumulators that, alternately, absorb and then emit energy again.

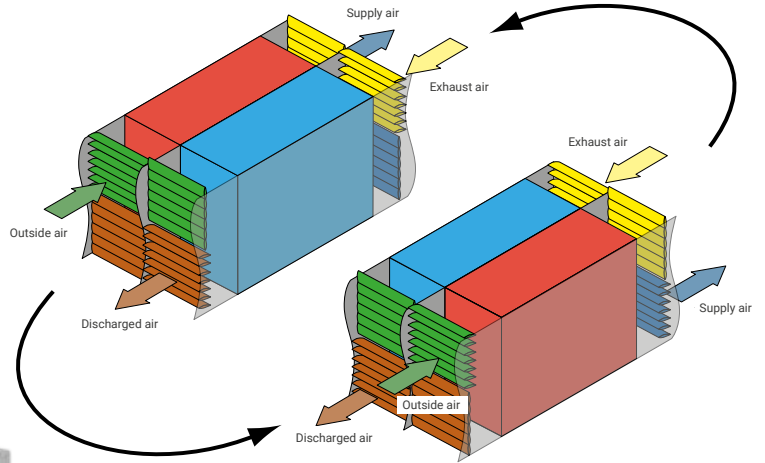
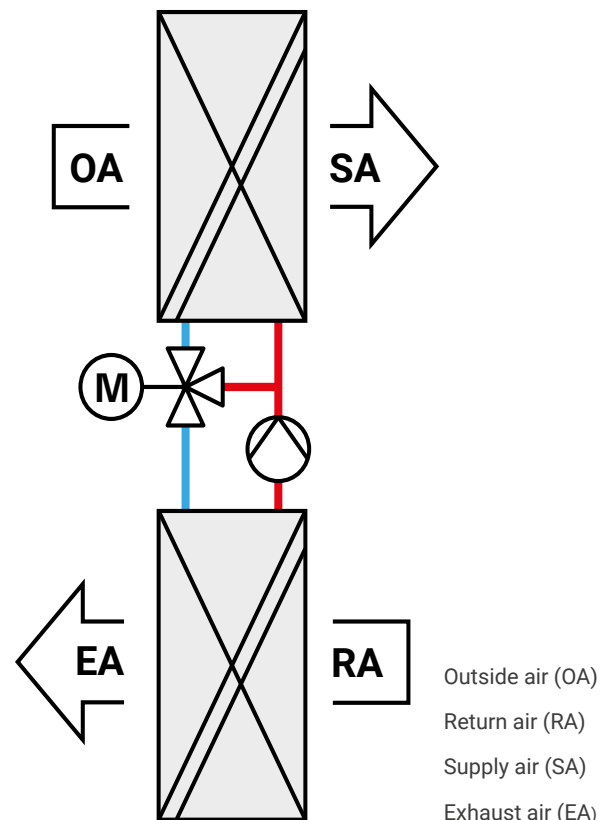


Image on left: The HANSA *etaHydro*® hydraulic station can be supplied with a control system and as a redundant design.

Closed-loop system (KVS)

If separate air handling units are implemented for supply and exhaust air, or if the air lines need to be separated, heat recovery can be realised via the closed-loop system (KVS). The heat transfer medium is a brine that absorbs or releases heat energy via air/brine registers.

The principle behind the KVS ensures it robustly resists any pressure differences between the air lines and ensures perfect separation of exhaust and supply air. Consequently, use of the KV system is mandatory for category ETA-4 exhaust air.



COMPONENTS - REFRIGERATION

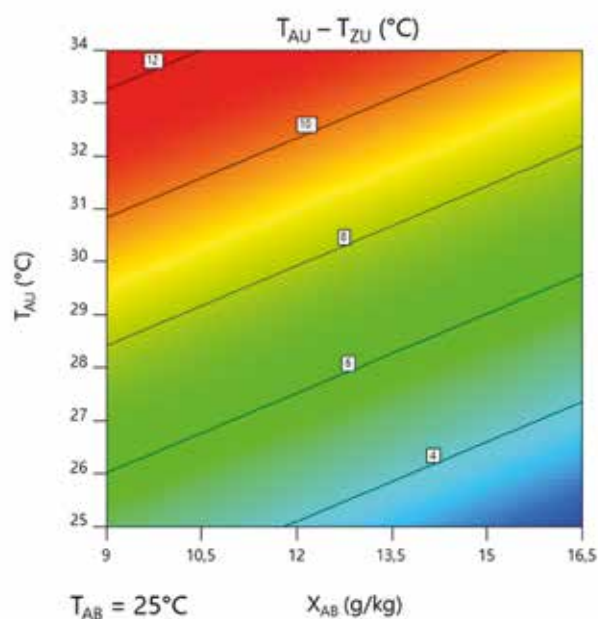
Adiabatic cooling systems

HANSA provides an adiabatic cooling system that it developed itself (Blue Line DPT-ASB+). When cooling is required, the plate heat exchanger is sprayed with highly atomised water on the exhaust air side, whereby the exhaust air is cooled



through adiabatic humidification and the energy required to evaporate the residual water is obtained from the exchanger in the form of heat. The HANSA ASB system has no moving parts and is, consequently, maintenance-free. Cooling of the outside air achieved is up to 12K. Consequently, the recommended temperature difference between the outdoor and indoor temperature of 6K can generally be achieved. No direct moisture input occurs on the supply air side, so the absolute humidity is not increased.

Intensive investigations and optimising work were carried out with the Blue Line DPT-ASB+ system at HANSA. This contour plot showing the cooling potential of outside air at an return air temperature of 25 °C and different return air humidities is one result. The cooling effect logically decreases considerably where humidity is higher, as the return air can only absorb a minimal amount of additional water. A temperature reduction of up to 12K can be achieved where humidity levels are low.



Mechanical refrigeration

Mechanical refrigeration systems are an indispensable component of full air conditioning units. They cool and dehumidify air taken in or treated and are, consequently, essential for the maintenance of a defined indoor climate.

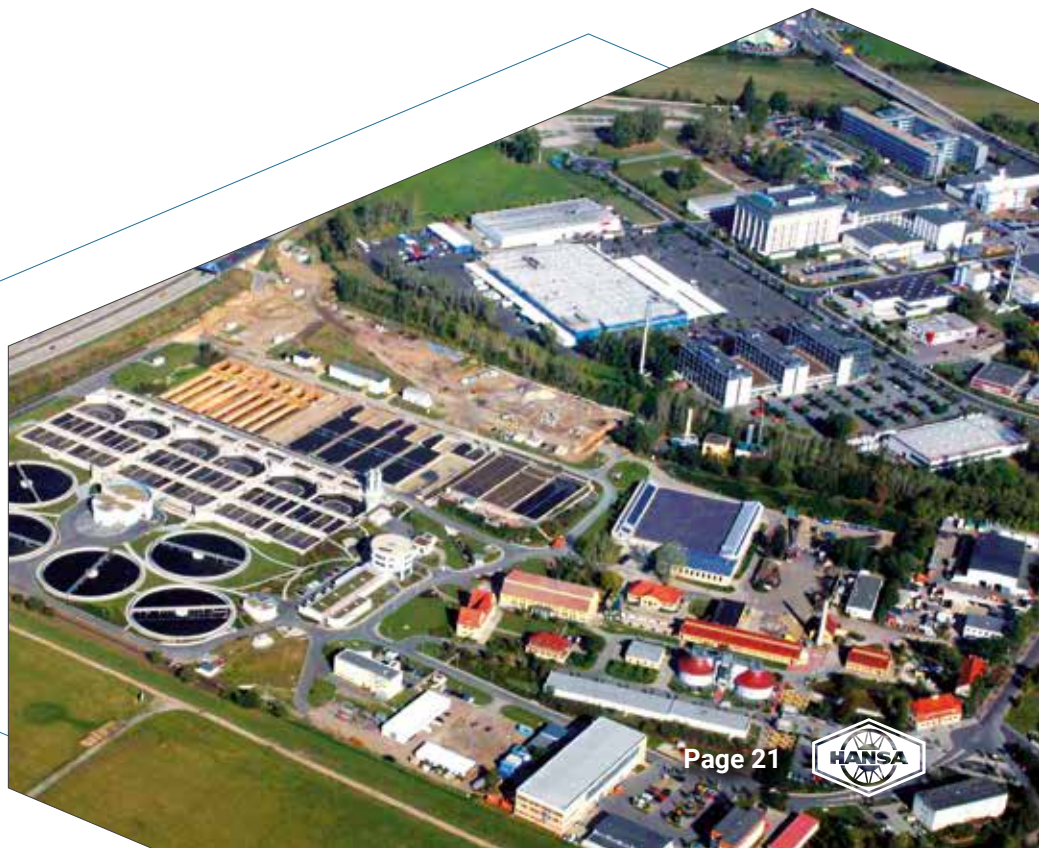


HANSA provides:

- The refrigeration layout and installation on your premises
- Different control strategies, including cost-effective speed-controlled refrigeration compressors (HANSA *etaCool*)
- Integration in an external refrigeration system
- First-class components and perfect refrigeration installation
- Environmentally friendly and needs-based refrigerants

(Image on right, third from top) PETER / LACKE is a medium-sized enterprise with more than 100 years of cross-industry experience in the development and production of high-quality painting systems for the automotive, electronics, lifestyle and glass sectors. The company invested €24 million in its Hiddenhausen location and constructed two new buildings which were occupied in 2020. HANSA delivered three highly efficient air handling units for the building.

The laboratory facilities of the Dresden-Kaditz wastewater treatment plant are air conditioned with HANSA Blue Line ASB units.





A number of buildings on the campus of Harvard University (Cambridge, Massachusetts) were equipped with HANSA air handling and air conditioning units over a period of several years.

etaCool refrigeration technology

etaCool is our term for cooling circuits with a highly efficient control system integrated completely into our air handling units (*eta* is the Greek letter used to denote efficiency).

This includes:

- Inverter-controlled refrigeration compressors
- Refrigeration systems with a digital scroll

The speed-controlled operation of a mechanical refrigeration system is the most efficient solution for continuously adapting cooling capacity to the current requirement. This needs-based continuous control enables the achievement of operation with extreme energy savings

and of the highest efficiency. Expensive stop-and-go operation is prevented and the service life of the air conditioning unit is enhanced. Maximum levels of efficiency can be achieved with this system, particularly in the partial load range.

Heat pump operation

A refrigeration system integrated into the air handling unit can, if required, provide an option as a heat pump for efficient heat generation.

The combination of an efficient heat recovery system and a heat pump controlled with *etaCool* offers a highly efficient heat generating option in the transition period between spring and autumn in Central and Northern Europe.

An additional heating system is then only required in winter in the case of very low temperatures in order to cover the peak load. We can also realise cooling circuits reversibly. This means that, with a refrigeration system, cooling in summer and heat pump operation in winter can both be realised through switching. The heat pump represents an effective reheating system in the area of swimming pool dehumidifying (see our pool catalogue).



Grand Hotel Bellevue, Gstaad.
Swimming pool dehumidifier
with highly efficient heat recovery
system and heat pump.

Stadtbad Schöneberg, Berlin.
Weatherproof swimming pool
dehumidifier with
heat pump.



Pool Line roof unit with control cabinet,
Strandvågen, Stockholm.

COMPONENTS - CONTROL TECHNOLOGY

Our electrical department has decades of experience in the control of AHU systems. We rely on different systems in this respect to address the needs and requirements of our customers in an optimum manner in each individual case.

Control strategies depend on the components installed and their wiring, the requirements (e.g. operation for a swimming pool, hospital, church, etc.) and operating conditions (e.g. geographic location). Ideally, a detailed clarification already occurs in the offer phase. Appropriate latitude must be ensured where this is not possible in order to allow for the adaptation of parameters and algorithms, even after commissioning. Hand-held terminals, LCD panels, web panels or the connection of a standard PC via Ethernet (LAN and Internet) enable access to the

technology, whose options are defined exactly through the user function. We create different user levels for this purpose, each of which is secured by a password. Remote access via *etaConnect®* (see p.26 and p.27) is highly recommended. This method enables cost-effective remote maintenance by our team in our main plant through which the majority of tasks arising can be handled without them being present on-site.

We integrate our technology into your building management system where necessary. The required interface is typically based on BACnet, Modbus or Saia S-BUS protocols. We can, of course, provide these and other industrial standards.

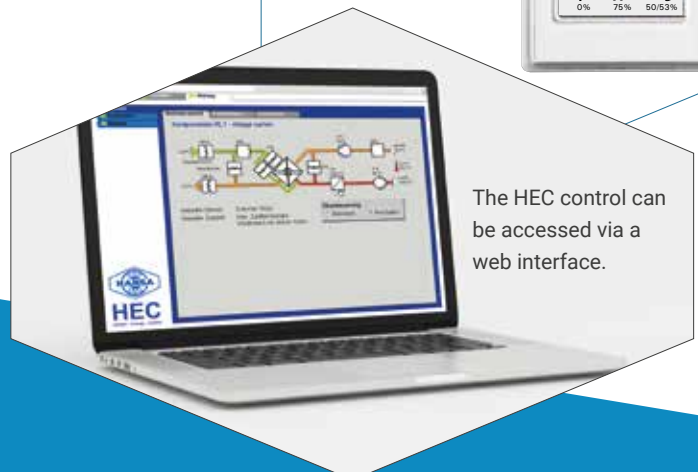


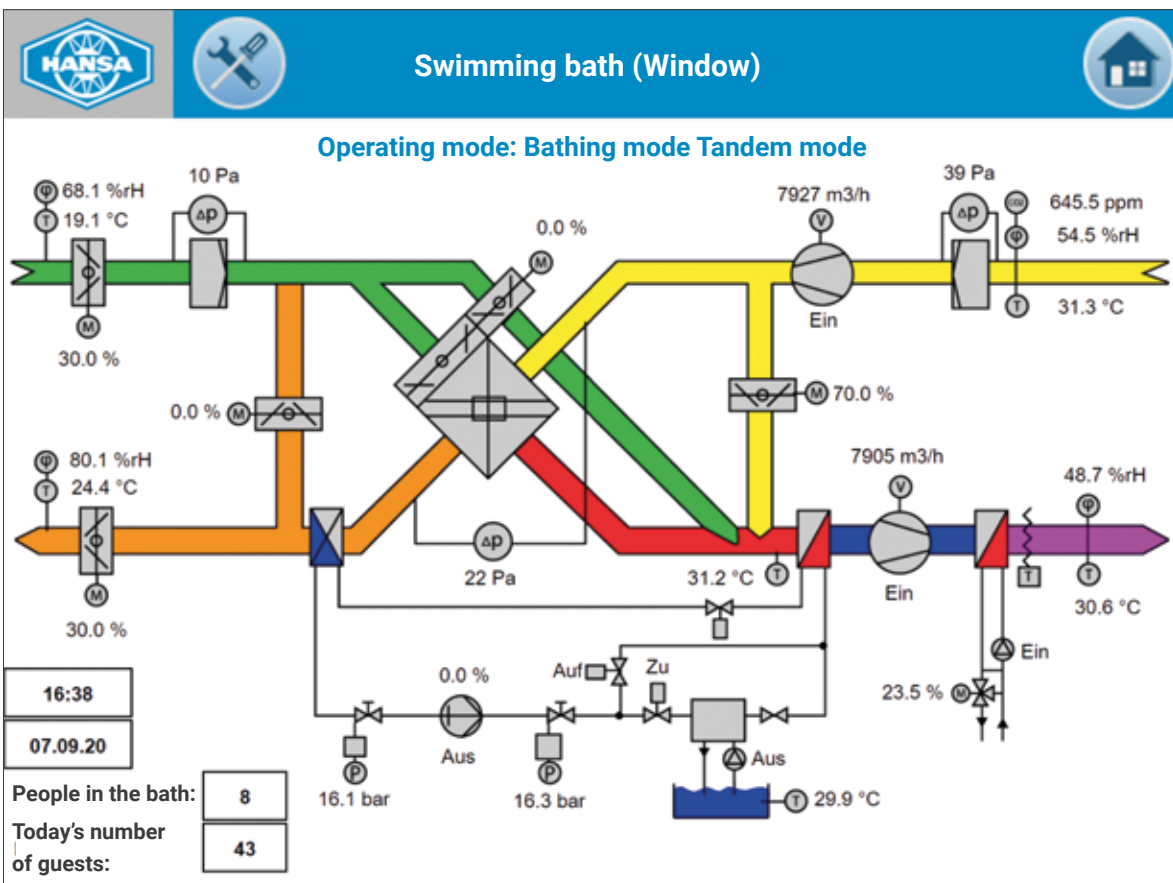
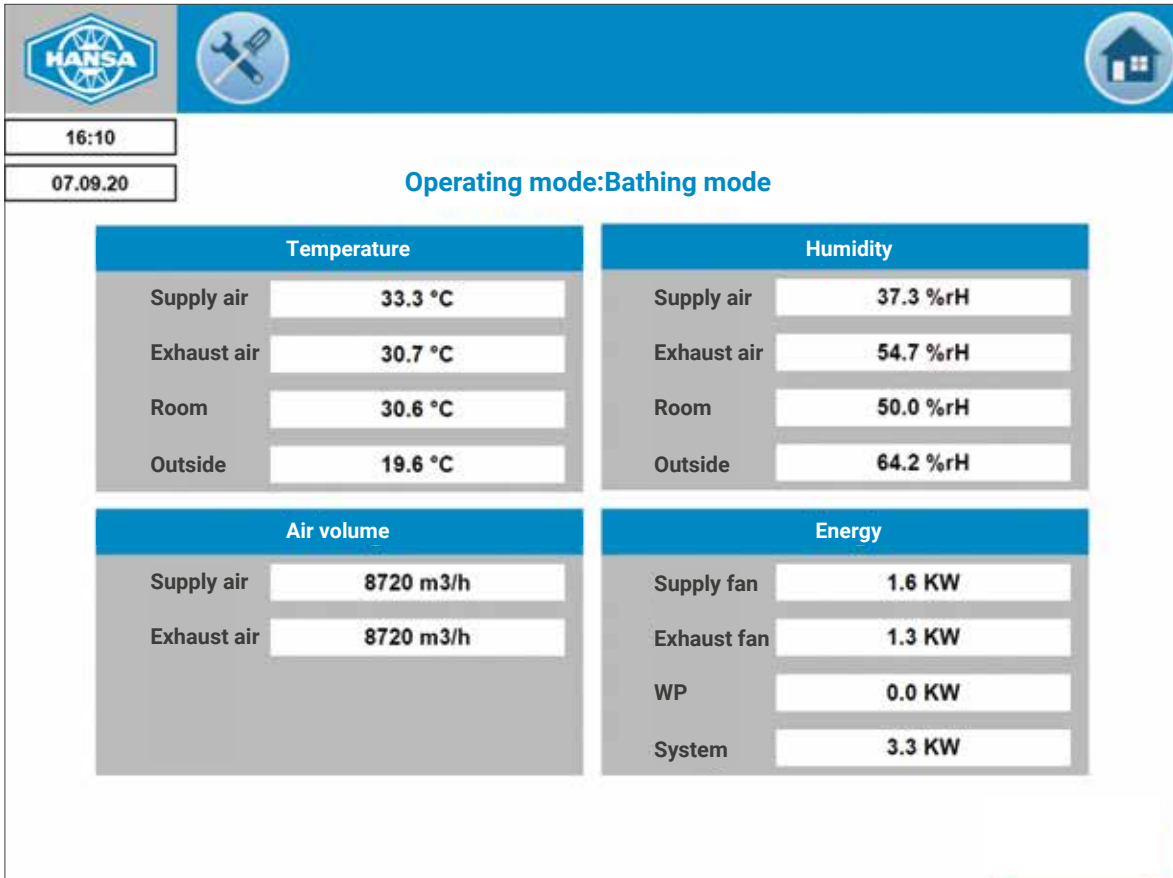
Control cabinet with Saia-Burgess DDC.

Touch panel for the DDC module of the HEC control.



The HEC control can be accessed via a web interface.





HTML5 is employed for our system visualisation, meaning it can be depicted in high quality on all web-capable devices.

Simply download our HANSA *etaConnect* app, or use it via an Internet browser and monitor and control your devices from anywhere!



etaConnect[®] **WE'LL KEEP IN TOUCH...**



etaConnect[®] refers to the general possibility of connecting to our air handling units with integrated control via a secure connection. We provide a portal with

which either we ourselves can access the system in the event of a malfunction, or you as the customer can access it – regardless of where you are.

The highlight

Each of our units that we equip with a control system (DDC) is fitted in the factory with an LTE modem. Data protection and data security are extremely important for us – and our customers. That's why we ensure that we can only connect with the unit if the operator has explicitly enabled access for this purpose. Our modem is switched off completely in normal mode, meaning neither we nor

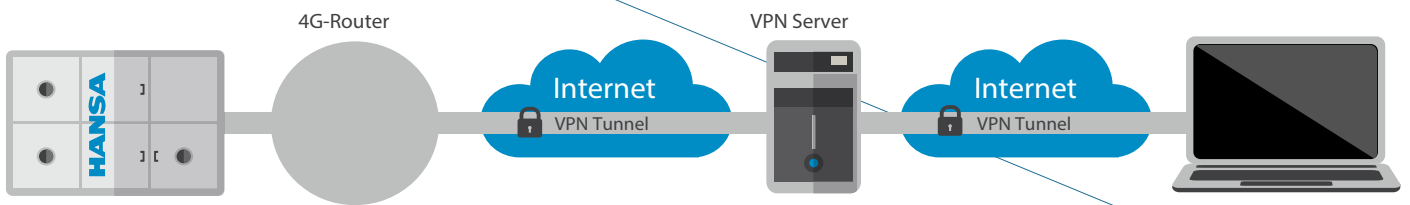
anybody else can connect to the unit or, where pertinent, the linked network. The modem is also completely disconnected from the remaining network when it is enabled. It really couldn't be any safer!

This module, which is already integrated into every unit with a HANSA control system, is *etaConnect*[®]-lite.

etaConnect modules

etaConnect® etaConnect®Plus

VPN and web proxy customer access	✓	✓
Android / IOS app		✓
Data logging		✓
Alarm management		✓

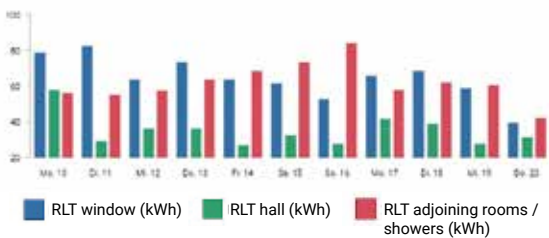


Data is transmitted safely via routers and VPN servers

Your benefits

- Rapid reaction to alarms and faults
- Greater overall system effectiveness
- Enhanced efficiency during maintenance
- Lower maintenance costs
- Online control updates (e.g. for security updates)
- Individual dashboards
- Linking of other system elements (heating, CHP, etc.)

Energy Electricity per day



Energy heat RLT window

175.270 kWh

Energy Electric RLT window

131.550 kWh

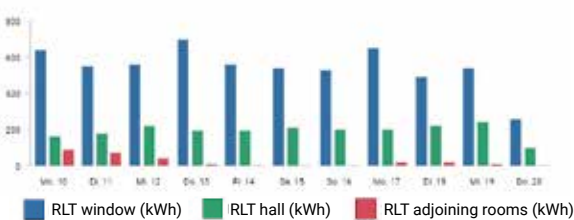
Energy heat RLT hall

11.180 kWh

Energy Electric RLT hall

1.680 kWh

Energy Heat per day



Energy heat RLT adjoining rooms

980 kWh

Energy Electric RLT adjoining rooms

2.480 kWh

FURTHER PRODUCTS

Slim Line

Manufactured in the thousands, the highly efficient and compact units for cooling rooms under high thermal stress have an energy advantage of over 70% when compared to purely recirculation or split units.



Free Line

Our Free Line units are freely adaptable and configurable air conditioning units for free cooling of server rooms or general dissipation of process heat. They can be perfectly adapted to a range of application areas.



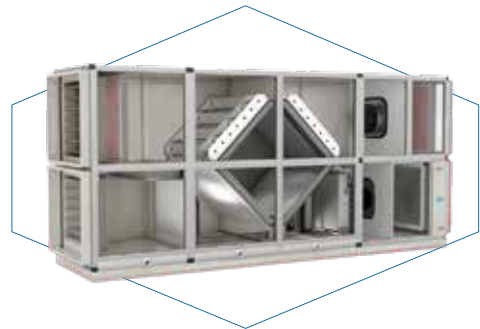
ReCool Line

Recirculating air cooling units for cooling rooms under high thermal stress. Whatever the marginal conditions may be, place your trust in HANSA, the air conditioning specialist, and select the right recirculating air cooling unit for your needs.



Pool Line

Swimming pool dehumidifiers provide guaranteed comfort and constant building protection. You too can benefit from the durability and energy efficiency of our units while, simultaneously, also reducing your operating costs.



Compact Line

The concept behind this product line enables cost-effective manufacturing with simultaneous flexibility and application freedom, thanks to modularisation. A higher quality standard and cost-effective operation are guaranteed.



Special units

Special units encompass the LF-HY (food hygiene) and Hygro Line (recirculating air dehumidification) product series and Hepa Tower (400 and 1200) air handling units. You can obtain more precise information on all products on our website.



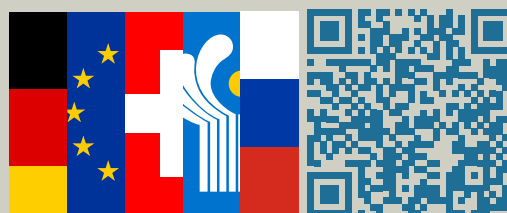
NOTES

Lined area for notes.

**FIND YOUR CONTACT IN GERMANY
AND INTERNATIONALLY ON OUR WEBSITE:**



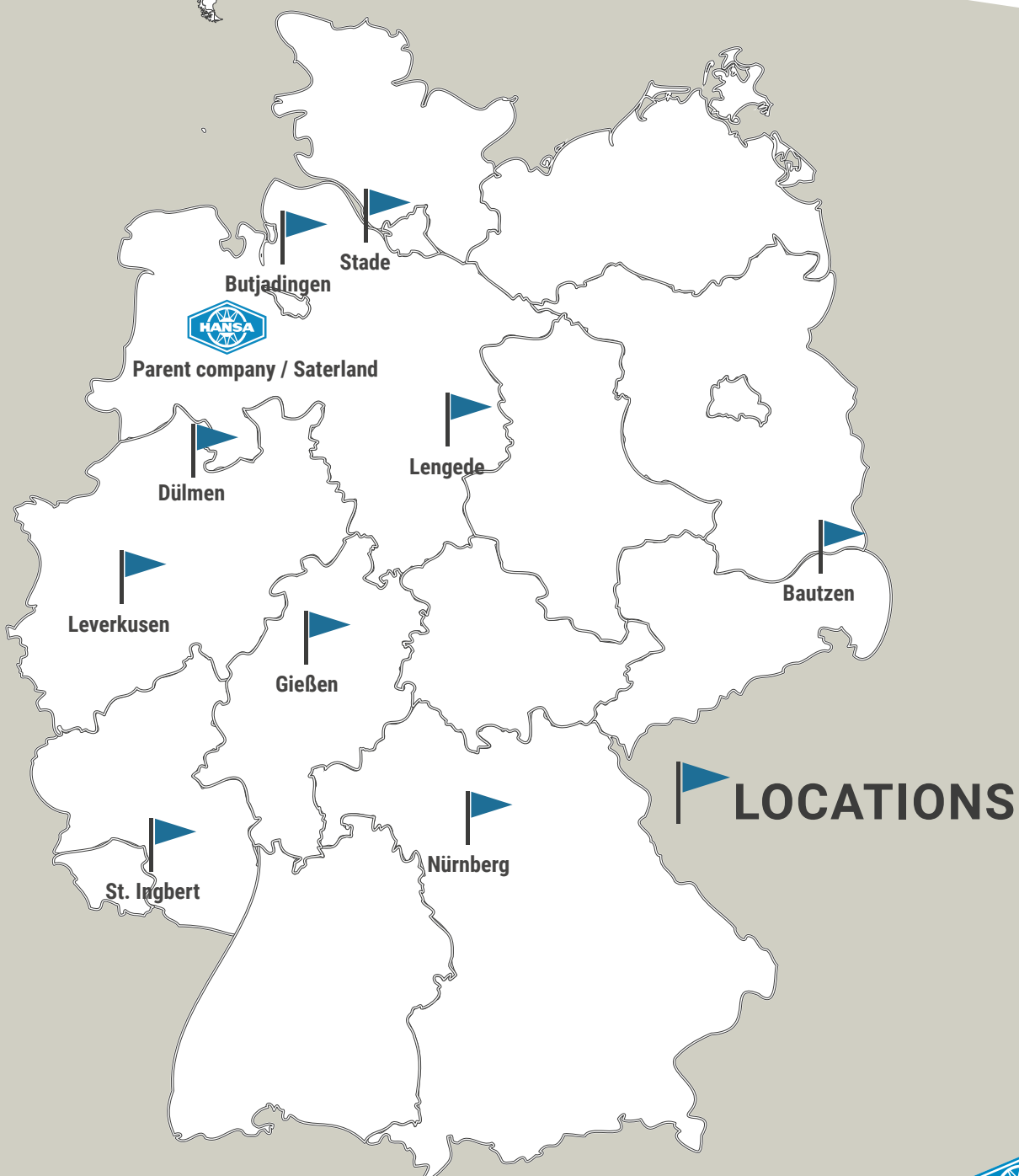
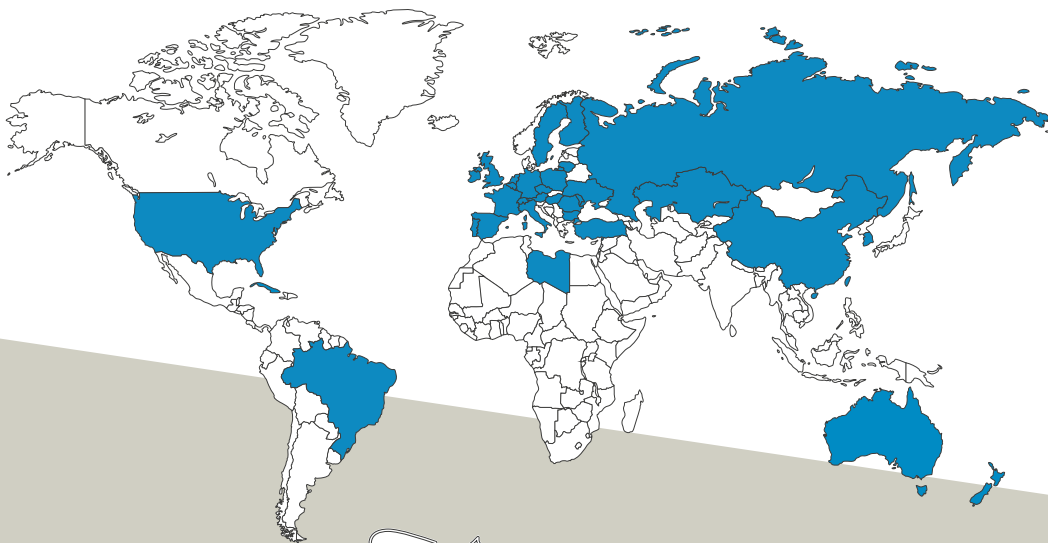
hansa-klima.de/en/distribution/national



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Our units around the world





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