

EDITORIAL



Philipp Bayat, Dr. Monika Bayat, Heinz Bauer (from left to right)

The high pollutant emissions from diesel fuels have become the focus of environmental policymakers – and rightly so. But while there is certainly urgent need for action, electric vehicles alone will not be able to mitigate the problem within the foreseeable future. The fastest and most efficient solution for cutting emissions to tolerable levels is to use environmentally friendly natural gas and low-toxin biomethane from climate-neutral sources. Having installed over 1,000 natural-gas fuelling stations around the world, BAUER is highly experienced and will play a major role in building the necessary CNG infrastructure. One of the major CNG projects which BAUER is working on currently is with TOTAL which, in return, is providing standardised compressor systems for the globally operating French retailer Carrefour in its effort to switch its entire delivery transportation to biomethane.

Heinz Bauer
Dr. Monika Bayat
Philipp Bayat

BAUER KOMPRESSOREN BAUER GOES INTO OPERATION AT HAMBURG UNIVERSITY



These state-of-the-art premises house the new nanoresearch centre at Hamburg University's campus.

The abbreviation CHYN stands for one of Germany's most cutting-edge research institutions, the new Center for Hybrid Nanostructures.

Located at Hamburg University's Bahrenfeld Research Campus, the Center was ceremonially opened on 19 July 2017. CHYN's work involves research into nanotechnology and its applications, with a particular focus on hybrid nanostructures. Here, the properties of solid bodies and biomaterials are analysed and aligned to develop materials with new properties – hybrid nanostructures – for chemical, biological and medical applications. One practi-

cal example of this process for the future is the development of nanoscale bioelectrical implants to replace damaged human sensory cells. The international significance of nanophysics is reflected in the enormous investments totalling 61 million Euro provided by the German state and Hamburg University for the new Center.

At the heart of the facility is a low-vibration clean room in which researchers can build their own nanostructures. The measurements required to verify research results are performed to the maximum precision at ultra-low temperatures which can only be achieved



Two progressive GB 23.2 rare gas compressors operate as an interconnected unit to compress the costly helium recovered during measurement.

by using liquid helium. However, the helium that escapes during the measurement process is too valuable to allow it to simply dissipate. The new helium recovery systems from BAUER prevent this loss of helium.

Two progressive air-cooled GB 23.2 compressors, operated as an interconnected unit and centrally controlled by a B-CONTROL SUPERIOR, compress the recovered helium to the required final pressure. Before the highly compressed helium is returned to the system, it is purified and dehumidified by

two high-efficiency SECCANT 3AH regeneration dryers.

Various BAUER helium compression systems have been performing reliably at other faculties at Hamburg University for many years – a factor that will certainly have influenced the University’s decision to choose BAUER KOMPRESSOREN for the new facility. ■

BAUER KOMPRESSOREN BAUER AND DR. ULI FREIER

Famous Arctic researcher Dr Uli Freier visited BAUER KOMPRESSOREN’s Geretsried location recently and gave a talk of almost 90 minutes to an audience of company employees and media representatives. His subject was climate change and the consequences of rising carbon levels in the atmosphere and the oceans.



A BAUER MARINER provided a reliable supply of breathing air on the Polarstern’s 2013 expedition.

Dr Freier spent the winter of 2013 in the South Polar Sea aboard the German research vessel ‘Polarstern’ with a team of international researchers, investigating the impact of climate change on krill stocks. The work involved undertaking extremely difficult and challenging ocean dives. At water temperatures below 0°Celsius, any technical problem could have placed the divers in a life-threatening situation. To rule out all risks, the expedition had chosen a specially equipped BAUER MARINER 320 compressor which provided a reliable supply of extra-dry breathing air even under the most extreme Arctic conditions. Dr Freier then showed a short film of the expedition, giving a graphic and almost palpable picture of the physical and psychological stresses under which the team was working. He explained the current status of research, presenting the unvarnished facts in stunning graphics and clearly showing his dedication and passion for the subject. In the third part of the talk, Dr Freier gave a compact outline of the dramatic changes resulting from the current situation and the consequences humanity must expect to face in the future, all delivered with an urgency that resonated in his listeners’ minds long after he had finished.



Heinz Bauer greets Dr. Uli Freier at BAUER KOMPRESSOREN.

The profound impact of his speech on the audience was demonstrated by the lengthy discussions that followed.

All listeners were unanimous in their appreciation of hearing solid facts instead of fake news, and everyone went away vowing to do what they could to fight climate change at their personal level.

As a company, BAUER KOMPRESSOREN will naturally continue to support the next research journey on the 'Polarstern' by providing a BAUER compressor system to supply reliable breathing air. The next trip is scheduled for 2018 and will visit western Antarctica to gather new findings in this area. ■

BAUER KOMPRESSOREN BAUER AND LINDE

In mid-September, Dr. Christian Bruch, Member of the Executive Board of Linde, visited the BAUER production facility at Geretsried, accompanied by Johann Lesser, Head of Production Management, and Philipp Bayat, Chairman of the BAUER GROUP. The purpose of the visit was to explore new areas of expansion for the successful partnership which has been in place between the companies since 1962. Discussions were followed by a tour of the facility, in which the high-ranking delegation had the opportunity to examine the BAUER GROUP's production expertise in action.

The visitors' primary interests focused on the production operations, especially their flagship assembly plant with its

cutting-edge technology. The tour centred on a presentation of the new VERTICUS stationary industrial compressor, featuring striking design, smartphone-driven remote control option and integrated B-DETECTION online gas measurement system. To showcase the newly developed modular system concept in practice, the visitors were introduced to BAUER's water-cooled BK 26 compressor blocks, which raise the bar in their performance class by offering even more cost-effective and quieter operation. The delegation showed enormous interest in the concept within the context of Industry 4.0, the 'Fourth Industrial Revolution', and its implementation. The modular system design clearly demonstrated BAUER's potential for playing a defining role in an expanded partnership in the future. During an interview, Dr. Bruch expressed his admiration for the culture of the family-run BAUER GROUP, the high level of vertical integration and the company's ability to combine high-tech processing centres



The new VERTICUS offers a sleek modern design and cutting-edge features.

with cutting-edge concepts in logistics and lean assembly:

"I am deeply impressed to see the enthusiasm with which the members of BAUER put the company's values into action. It's obvious that each and every one of them truly focuses on quality in all their activities. (...) A common understanding of quality, reliability and mutual respect is definitely the basis for collaboration as a team."

In addition to the aim of stepping up existing partnerships in the fields of cryotechnology and medical air, new joint projects in the future-oriented



Touring the new production plant: Philipp Bayat, Johann Lesser, Dr. Bruch, Peter Kamm (from left to right)

area of low-emission, climate-friendly vehicle fuels are seen as offering exceptional potential. ■

BAUER KOMPRESSOREN BAUER AND DRÄGER

On 24 October 2001 a terrible fire occurred in the Gotthard Tunnel, costing the lives of 11 people. The disaster was the trigger for a complete overhaul of tunnel safety and rescue concepts, which now focus on the deployment of firefighting and rescue trains (LRZ).

A cornerstone of the LRZ, and an aspect that can make all the difference between life and death, is a supply of highly purified breathing air for the firefighting and rescue teams and the evacuated passengers. The breathing air supply must be delivered independently of the environment of the train and must be one hundred per cent reliable, as the trains are in a contaminated environment when they are in the tunnel on firefighting missions.

The entire breathing air technology installed by Dräger Safety in its LRZ trains is produced by BAUER KOMPRESSOREN. BAUER compressors are stationed on board all LRZ trains that engage in emergency operations. The trains currently in use are equipped with BAUER KAP 220 compressors with high free air delivery, combined with a BAUER P Series external breathing air purification system.

Depending on the location of operation for the LRZ, a compressor system is installed either on board the train or



A Swiss firefighting team kitted out with full-scale breathing equipment puts the new tunnel rescue train to the test under real-life conditions. The air is supplied by a BAUER compressor system.

in the Emergency and Intervention Centres (EIZ) at the tunnel entrance. In the EIZs, breathing air is compressed on site and stored in giant racks of breathing-air tanks on the roof of the train. These racks can store an incredible two million litres of breathing air per train, to supply the officially specified numbers of 120 passengers, 16 crew and 20 firefighting personnel. The air is used to fill the breathing apparatus of the firefighting team and to create overpressure inside the train in an emergency situation, preventing smoke or contaminated air from entering the train from the outside. The new Gotthard Base Tunnel, opened in mid-2016 and the longest railway tunnel in the world at a length of 57 kilometres, imposes the highest standards on the operation of the new rescue and evacuation concept in the event of fire in the tunnel. The Base Tunnel, the Lötschberg tunnel – which opened in 2007 – and the Ceneri Base Tunnel, in the Swiss canton of Ticino,

together make up the NRLA (New Railway Link through the Alps).

If a passenger train catches fire in one of the tunnels, the LRZ rescue trains enter the unaffected parallel bore. According to the Swiss Federal Transport Office, they can reach the location of a fire within 45 minutes at the latest; on arrival, the firefighting teams access the location through cross-connections between the two tunnel bores to begin their work.

A passenger train withdrawn from regular service is deployed to evacuate the passengers within the official safe-



BAUER breathing-air filling system in the EIZ emergency centre.

DID YOU KNOW?

How does B-DETECTION actually work?

Faced with rising levels of carbon dioxide (CO₂), carbon monoxide (CO) and other toxins in ambient air, many breathing-air users rightly ask, “How can I be sure that my breathing air is clean, and who will warn me in good time if the air I need to breathe during diving or firefighting is suddenly contaminated by toxins?”

The short answer is that this can only be guaranteed by an online gas measurement device, like B-DETECTION PLUS from BAUER KOMPRESSOREN. B-DETECTION PLUS continuously measures the composition of compressed air or oxygen-enriched air (nitrox) and monitors its CO₂, CO and O₂ content. Absolute humidity and volatile organic compounds (VOCs) can also be measured depending on the device model. Air is extracted at a point between the purification system and the filling outlet (filling panel or similar), and passes into the B-DETECTION device. The pressure of the extracted air or gas is first reduced to approx. 4 bar, then to ambient pressure. The airstream is then directed past individual sensors, each specialising in measuring one of the components listed above.

Caution is required in sensor-based measurement, because if poor-quality sensors or incorrect calibration/monitoring produce false results, the results may involve damage to the equipment used – or even damage users’ health. Measurement is only as precise as the quality of the sensors and the pre-measurement calibration allows.

With this in mind, BAUER chose to use exceptionally high-quality sensors. The sensors used in B-DETECTION are smart sensor modules (SSM) comprising the sensor cell, a microcontroller and a storage module. The integrated storage module saves information including the sensor production date and calibration values. The microcontroller processes the measurement signal, so that the sensor module delivers a prepared signal. It can also monitor the service life and functioning of the sensor.

The design service life of the electrochemical sensors (O₂ and CO) may be extended by adding a humidifier unit



B-DETECTION PLUS

upstream of the sensors. This humidity membrane is only permeable for water vapour. It can increase the humidity of the measured gas to the same level as the ambient air. If limit values are exceeded, the control unit displays a visual warning and shuts down the system before contaminated air can pass into the cylinders being filled. Any infringements of limit values are logged by the B-CONTROL MICRO system control unit and can easily be exported as an Excel file using a standard SD card. In cases where limit values are briefly exceeded, an automatic flush valve (optional) discharges contaminated air to the outside without interrupting operation of the system.

BAUER’s B-DETECTION PLUS provides operators with the maximum security concerning health and legal liability issues.

Heinz Bauer

ty target of 90 minutes after the outbreak of the fire. If the train on fire is a goods train, a different scenario is put into action: where possible, the burning train is pulled out of the tunnel so that the firefighting team can work in the open air. Latest-generation LRZ firefighting and rescue trains are designed to pull trains up to 750 metres in length and weighing up to 1600 (!) tonnes. ■

BAUER KOMPRESSOREN BAUER AND SENSATA TECHNOLOGIES

From automotive applications to aviation and wireless technology, sensors and control systems from the leading global brand and innovator, Sensata Technologies, are now an indispensable part of our day-to-day lives. Integral to myriads of applications, they enhance safety and security, energy efficiency and climate protection. The major global corporation has a portfolio spanning 17,000 different products, with a total annual production and delivery volume of 14 billion items.



BAUER systems at Sensata Technologies



Sensata's headquarters in China

Pressure sensors make up an important sector of this product range. They are used in vehicles to optimise fuel injection pressure thus fuel consumption, and to apply the precise level of braking power required.

In air-conditioning systems, they are used to protect the cooling compressor from pressure overload and optimise its pressure to ensure economical operation. Top reliability and precision are absolutely crucial in sensitive applications like these, particularly those involving high pressures.

To ensure that these standards are reached, the sensors must first be calibrated then tested. The systems used in this testing are continuously supplied with pure highly compressed air by BAUER compressor systems during their 24/7 operation. Sensata sought out BAUER as a strategic partner because of BAUER's legendary product quality and ability to meet the sensor experts' rigorous requirements concerning precision and reliability. In addition, BAUER's global network of companies and sales organisation ensures that parts can be supplied rapidly whenever they are needed and maintenance can be performed anywhere in the world.

The key to BAUER's success – demonstrated by its now 15-year partnership with Sensata – is the uncom-

promising reliability of BAUER systems in operation at all the company's locations throughout the world, even under the harshest and most challenging climatic conditions!

In China alone, over ten large-scale air- and water-cooled BK 23 and BK 26 compressor systems are in operation for testing processes, while Malaysia has a further six systems of the same model. Sensata's production facilities in Bulgaria, India and the USA have likewise introduced numerous new BAUER systems in recent years, with further projects in the planning stage. ■

BAUER KOMPRESSOREN BAUER AND ENVITEC

The finishing touches are put to the system, factory acceptance testing is passed with flying colours, and the housing is loaded onto a special transporter.

Its green exterior finish clearly signals the eco-friendliness of the fuel that will be fed into the gas grid in the future: biomethane, natural gas derived from biogas with a purity level of 98 per cent, which is highly compressed by a BAUER CFS 23.8-38 compressor system. Engineering expertise was required for the sophisticated control unit, combined with a special bypass system and frequency inverter.

Production of biogas poses a range of special challenges; the volume of biogas produced by bacteria may vary considerably, and these fluctuations must be balanced out by the compres-



A biomethane station destined for France is loaded for transport.

sor system during operation. The project was the first partnership to take place between BAUER KOMPRESSOREN, technology leader in natural gas compression systems, and biogas and biomethane specialists EnviTec.

Further projects are in the planning stage. Both companies have established a powerful collaboration to drive this growth market successfully. The system is destined for the Breton town of Etreville in north-west France near Le Havre. As the host of the Paris climate change conference, France is focusing on the topic of biogas; the country is funding construction of similar systems for generating biogas and processing it to biomethane.

In addition, France has appointed the establishment of an infrastructure of natural gas fuelling stations as a further priority for rapid implementation. The climate summit and the diesel scandal have added enormous urgency to the pressing topic of climate-neutral mobility.

The chosen approach, as a final and irreversible course of action, is to support and propagate drive systems based on renewable energy sources or climate-neutral fuels. A vital element in progressing these developments is the use of biomethane as fuel, which can deliver carbon savings of up to 97 per

cent. In future, BAUER will make a major contribution towards climate protection in this area. ■

BAUER TRAINING CAD/CAM AND 5S

At the start of the new training year, UNICCOMP and BAUER KOMPRESSOREN welcomed a total intake of 30 trainees and one dual student*.

Over the past 18 months, investments in training have focused on a modern CAD/CAM programme, which has added expertise in the BENZ Cam system used in UNICCOMP's production operations to the Solid CAM software already in use at the training centre. "A core element in our training philosophy is to prepare our trainees for the real-life world of production at UNICCOMP and BAUER KOMPRESSOREN", explains Stefan Arnold, the Director of Training.

A further key part of the modern training programme is 5S, a lean management method. Training supervisor Eric Schilwat introduced the method to the curriculum with the help of his trainees. "The 5S method has definitely brought extensive changes to the training landscape."

Value-added or non-value-added? A targeted analysis of training courses was performed, applying the 'seven types of waste' concept. It revealed areas where resources were being wasted and opened the door for valuable improvements. The systematic division of the teaching workshop into individual sectors and the consistent use of visualisation are important for us – and of course



Markus Kraus proudly presents his component produced using BENZ CAD-CAM.

occupational safety is always a key topic in 5S audits. 5S stands for Sort, Set in order, Shine, Standardise and Sustain – maintaining the discipline to build on these improvements. Ralph Dischl, in his fourth year of training as an industrial mechanic, played a key role in implementing the system. "The systematic 5S audit has brought structure and guidance to our work. Living and breathing 5S involves improving continuously." Njomza Miftari, a 3rd-year industrial mechanics trainee, was responsible for the Hazmat sub-project, while Oláh Bence, a 3rd year machinist, headed the sub-project Tool Storage. ■

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* A dual student is a student whose studies cover both practical vocational training and theoretical learning.

BAUER Calendar

EXHIBITIONS 4TH QUARTER 2017

Exhibition	Topic	Location	Dates
BAUER COMPRESSEURS France (BCF)			
124 th Congrès National des Sapeurs-Pompiers	Breathing Air	Corsica	11.–14.10.2017
BAUER COMPRESSORS U.S.A. (BCI)			
DEMA Dive Equipment Manufacturers Association	Breathing Air	Orlando	01.–04.11.2017
BAUER COMPRESSORI (BCV)			
FAKUMA 2017	Industry	Friedrichshafen	17.–21.10.2017
BAUER KOMPRESSOREN Australia (BKA)			
Pacific 2017 Military Show	Breathing Air	Sydney	03.–05.10.2017
BAUER KOMPRESSOREN China (BKC)			
Power Transmission and Control	Industry	Shanghai	31.10.–03.11.2017
BAUER KOMPRESSOREN U.A.E. (BKG)			
OFSEC Oman	Breathing Air	Oman	09.–11.10.2017
ADIPEC	Breathing Air	Abu Dhabi	13.–16.11.2017
BAUER KOMPRESSOREN U.K. (BUK)			
Dive Show NEC	Breathing Air	Birmingham	21.–22.10.2017
BAUER KOMPRESSOREN Russia (BKR)			
PCV Expo	Industry	Moscow	24.–26.10.2017