

# PE-NITROX SYSTEMS

POSEIDON EDITION



SPORTS & SAFETY



## BAUER PE-NITROX – SECURITY WITHOUT COMPROMISES

For divers, nitrox gas has plenty of advantages compared to “normal” breathing air: longer no-stop times, less nitrogen saturation in the blood, and accordingly less exhaustion and faster recovery after a dive. However, using oxygen-enriched gas is a safety-critical procedure, and the strictest safety standards must be applied to both the equipment and its operation. The B-NITROX concept was developed by BAUER KOMPRESSOREN, market leader in the diving sector. B-NITROX sets standards for the technical design, construction and materials of equipment as well as state-of-the-art gas purification to guarantee uncompromising safety, and holds a type approval from international technical services corporation TÜV SÜD for its nitrox compressor.



### ADVANTAGES FOR DIVERS

- › Extends divers’ “no-stop times”
- › Reduces decompression and (nitrogen) narcosis problems
- › Lower nitrogen saturation
  - › Lower risk during multiple daily dives
  - › Reduces exhaustion after diving
- › Shorter surface recovery periods

### ADVANTAGES FOR FILLING STATIONS

- › Extended training program is available for courses using nitrox
- › Competitive edge over filling stations that do not offer nitrox or safe nitrox systems
- › Lower exhaustion levels for dive teachers engaging in regular dives

## BAUER – THE SAFETY-CONSCIOUS CHOICE

Dive4Life, Germany's biggest indoor diving pool, now offers a new and extremely attractive service: divers can now dive there with nitrox. Manfred Narres, owner and managing director of the premium location, insisted on a BAUER B-NITROX system reflecting his top priorities of safety for his customers and staff, plus absolute reliability of the compressor systems in use at his dive centre.



BAUER nitrox systems produce breathing air mixtures with oxygen content of up to 40 percent or diving instructors, ambitious recreational divers, professional divers and members of the armed forces on manoeuvres.

The law imposes clear and strict regulations on gas compression processes, which require exceptionally high certified safety levels. Our BAUER Nitrox Compressors obtained

a type approval from the international technical services corporation TÜV SÜD, upholding our principle that "Safety is non-negotiable".

An important aspect with respect to product liability in cases of accidents – especially for travel operators and hotels with diving centres on their premises.

## ONE-STOP SAFETY

The challenge is clear: reliable supply of nitrox 365 days a year, around the clock, without the need for outside oxygen logistics. BAUER's solution was to design a complete membrane system. BAUER supplies a perfectly coordinated turnkey system including all components from a single source, from the company's own ROTORCOMP screw compressor and the O<sub>2</sub> membrane to a custom nitrox compressor for compressing the nitrox mixture with oxygen content of up to 40 percent.



### 1 PE-NITROX MEMBRANE

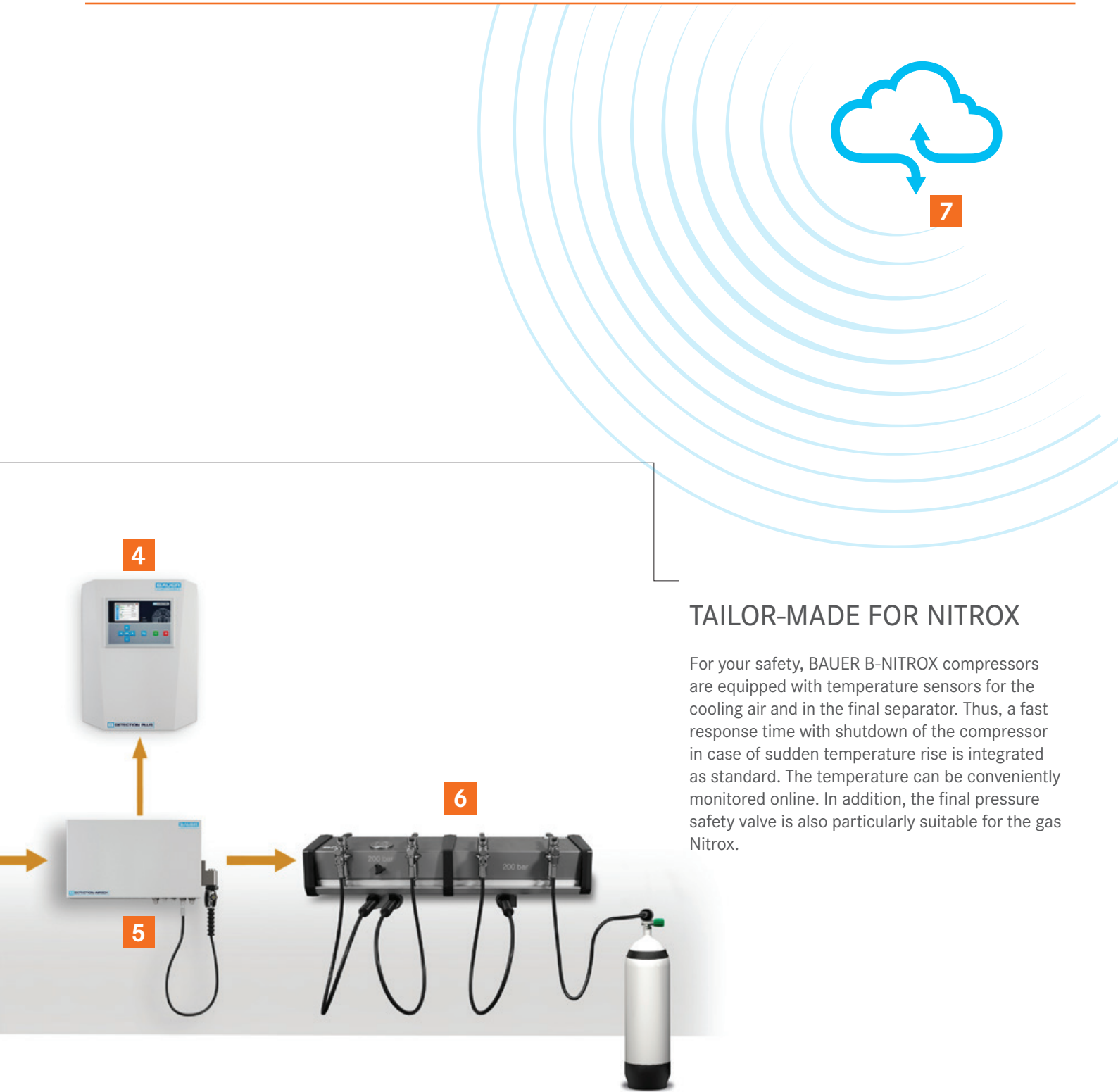
Produces nitrox mixtures with oxygen content of up to 40 percent

### 2 AERO-GUARD-OX

Reduces CO<sub>2</sub>

### 3 PE-VE-OX

Compresses the nitrox mixture to pressures up to 300 bar



## TAILOR-MADE FOR NITROX

For your safety, BAUER B-NITROX compressors are equipped with temperature sensors for the cooling air and in the final separator. Thus, a fast response time with shutdown of the compressor in case of sudden temperature rise is integrated as standard. The temperature can be conveniently monitored online. In addition, the final pressure safety valve is also particularly suitable for the gas Nitrox.

### 4 B-DETECTION PLUS s

Continuous monitoring of breathing air quality

### 5 B-DETECTION AIRBOX

Gasentnahmeeinheit

### 6 FILLING PANEL

For filling breathing air cylinders with nitrox

### 7 B-CLOUD

24/7 system monitoring and control management

# PE-NITROX MEMBRANE - THE ALL-IN-ONE SOLUTION

BAUER's PE-NITROX MEMBRANE is a compact, safe way of producing breathing air mixtures with oxygen content of up to 40 percent. All components are exactly matched for maximum safety. The system is designed for reliable nitrox supply to stationary professional diving centres, safari boats, liveaboards, yachts and cruise ships and for commercial diving missions. The membrane system is ideal for professional diving centres that prioritize safety, high charging rates, low maintenance and low operating costs.



- 1 Screw compressors** have an intake pressure of approx. 10 bar, required to supply the oxygen membrane in the system. The screw compressor with ultra-efficient "rolling profile" is a product of ROTORCOMP (BAUER GROUP).
- 2 Refrigerant dryer** for efficient cooling and condensate separation. Enables oxygen mixture to be produced irrespective of the ambient temperature: the continuously cooled membrane delivers optimum efficiency at all times.
- 3 Filter system** reliably removes oil and particulate to protect the membrane from harmful influences and extend its service life.
- 4 The oxygen membrane** boosts oxygen content by separating N<sub>2</sub> from the breathing air. The oxygen content of the breathing air can be set at any level between 21 and 40 percent<sup>1</sup>.

<sup>1</sup> Maximum oxygen level depends on the specifications of the selected membrane system..

## TECHNICAL DATA

Model number	Oxygen content	Compressor charging rate <sup>1</sup>		Motor / motor output		Net weight approx.	Dimens. L x W x H
		%	l/min	cfm	Motor		
PE-NITROX MEMBRANE							
PE-NITROX 260 B AS332	32	260	7,5	Three-phase current 400 V, 50 Hz	7,5	480	115 x 89 x 135
PE-NITROX 320 B AS32	32	320	11	Three-phase current 400 V, 50 Hz	11	480	115 x 89 x 135
PE-NITROX 320 B AS36	36	320	11	Three-phase current 400 V, 50 Hz	11	480	115 x 89 x 135
PE-NITROX 320 B AS40	40	320	11	Three-phase current 400 V, 50 Hz	15	480	115 x 89 x 135
PE-NITROX 550 B AS32	32	550	15	Three-phase current 400 V, 50 Hz	15	480	115 x 89 x 135
PE-NITROX 550 B AS36	36	550	15	Three-phase current 400 V, 50 Hz	15	480	115 x 89 x 135
PE-NITROX 550 B AS40	40	550	15	Three-phase current 400 V, 50 Hz	18,5	550	130 x 105 x 145
PE-NITROX 700 B AS32	32	700	18,5	Three-phase current 400 V, 50 Hz	15	480	115 x 89 x 135
PE-NITROX 700 B AS36	36	700	18,5	Three-phase current 400 V, 50 Hz	18,5	550	130 x 105 x 145

<sup>1</sup> Measured by cylinder filling (11.1 l) from 0 - 200 bar/ 2900 psig, ±5% at 20 degrees Celsius ambient temperature



# COMPRESSION TECHNOLOGY FOR NITROX

The compressor is the heart of any nitrox system. This is where the oxygen-enriched gas is compressed to a pressure of 300 bar. If heated and pressurized oxygen comes into contact with oil, things can get critical. BAUER therefore developed the OX compressor family tailored to nitrox compression, which easily fulfils the rigorous standards for this process.



PE320-VE-OX

## NONE PURER

As a diver, you rely on pure breathing air. Because your health and your needs are our top priority, BAUER B-NITROX Compressors supply pure breathing air in compliance with DIN EN 12021:20141.

BAUER offers decades of experience in air purification, in-depth research and tough material testing, adding up to outstanding quality and maximum safety.

In highly compressed air and gas purification, our aim is to minimize contamination from moisture, CO, CO<sub>2</sub>, oil and particulates.

As the market leader, BAUER KOMPRESSOREN supplies air purification systems that have built an excellent reputation worldwide for their cost-effectiveness and quality.

We supply a range of purification systems for many different applications: cartridge filter systems, refrigerant dryers, CO<sub>2</sub> removal systems and an array of monitoring systems to ensure compliance with breathing air quality specifications.

<sup>1</sup> Assuming compliance with intake conditions as detailed in the BAUER installation manual.

## TECHNICAL DATA

Model number	Compressor charging rate <sup>1</sup>		Max. operating pressure		Purification system	No. stages	Speed approx.	Motor / motor output		Net weight approx. <sup>2</sup>	Dimens. <sup>3</sup> L x W x H
	l/min	cfm	bar	psig				U/min	Motor		
<b>PE-NITROX Compressors</b>											
PE 320-VE-OX	320	11,5	330	4,780	P 41	4	1,450	Three-phase current 400 V, 50 Hz <sup>4</sup>	7,5	299	114 x 83 x 152
PE 550-VE-OX	550	20	330	4,780	P 41	4	1,230	Three-phase current 400 V, 50 Hz <sup>4</sup>	11	378	114 x 83 x 152
PE 700-VE-OX	700	25	330	4,780	P 61	4	1,400	Three-phase current 400 V, 50 Hz <sup>5</sup>	15	403	114 x 83 x 152

<sup>1</sup> Measured by cylinder filling from 0–200 bar (0–3000 psi), ± 5 %

<sup>2</sup> Weight increases by approx. 90 kg in the Super Silent version.

<sup>3</sup> Dimensions in Super Silent version: 148 x 83 x 152 cm

<sup>4</sup> Power plug: 32 A

<sup>5</sup> Power plug not supplied

## B-CONTROL MICRO

The B-CONTROL MICRO is a modern, easy-to-use compressor control unit with colour display that provides intelligent control and safe monitoring of all basic functions. It is integrated into the PE-VE-OX systems. Interaction between user and control unit is user-friendly and logical. An extensive language selection is now available.

- › Fully automatic monitoring of relevant parameters; compressor shuts down automatically if values exceed permissible limits
- › Oil pressure monitoring protects against incorrect rotation direction and other potential faults
- › Easy software update using SD card
- › The PE-VE-OX systems equipped with B-CONTROL MICRO can also be used with the BAUER B-BLENDING system to produce nitrox.
- › Unique feature: Display of remaining time to fill your pressurised air cylinder
- › Improved filter monitoring: If a B-SECURUS filter monitoring system is installed in your compressor system, the start display already shows predicted results such as current cartridge saturation level and cartridge change date.
- › Ethernet port for connecting to the B-CLOUD



B-CONTROL MICRO



## PERFECT TECHNOLOGY IN EVERY DETAIL

B-DRAIN is the new patented automatic condensate drain system. Its individually controlled solenoid valves at the compressor separators ensure reliable automatic condensate drainage and maximize filter cartridge life.

The principle is this: Condensate – an emulsion of humidity, lubricant and particulates from the ambient air – is created during the compression process. All separators in the system are therefore drained continuously during compressor operation and after shutdown, to remove the aggressive oil/water mixture (condensate) produced by the compression process.

The innovative concept of B-DRAIN provides for smooth, controlled condensate drainage with minimum pressure loss. This saves energy and improves the efficiency of the compressor system. At the same time the new B-DRAIN is significantly quieter than conventional solutions.

The condensate is collected in a tank for eco-friendly disposal.



B-DRAIN

## CO<sub>2</sub> UNDER CONTROL WITH AERO-GUARD

There is no doubt that the CO<sub>2</sub> level of the atmosphere is rising. This presents a problem for increasing numbers of breathing air filling stations, which can no longer automatically comply with the strict limit of 500 ppm specified in the DIN EN 12021:2014 Breathing Air Standard. This problem is particularly critical for nitrox membrane systems because of their design; the process of separating out N<sub>2</sub>t by the membrane increases not only the oxygen content in the nitrox mixture, but also the CO<sub>2</sub> content. AERO-GUARD is BAUER's ultra-efficient solution for permanently reducing CO<sub>2</sub> content below the limit specified in the Breathing Air Standard.

### AIR AND GAS PURIFICATION

#### AERO-GUARD-OX CO<sub>2</sub> Absorber

The AERO-GUARD-OX CO<sub>2</sub> Absorber is highly recommended as an add-on accessory for the nitrox membrane system, as the nitrogen separation process by the membrane significantly increases not only oxygen, but also CO<sub>2</sub> content. AERO-GUARD-OX reduces the CO<sub>2</sub> content of the oxygenated air – a function that is even more vital in nitrox production than in breathing air compression.

**NEW!** As an option, a lever can be used in conjunction with B-DETECTION PLUS to precisely adjust the CO<sub>2</sub> reduction – thereby extending the filter's service life.



AERO-GUARD-OX CO<sub>2</sub>-Absorber

### FURTHER INFORMATION

#### › Cost-effective in operation

At flow rates of up to 1,000 l/min, the filter cartridges have a service life of approx. 50 hours before they need to be replaced. If the compressor's flow rate is lower, the service life of the filter cartridge is extended accordingly.

#### › Adjustable version

An adjustable version of the B-AEROGUARD is available as an option. This requires the additional use of a continuous gas monitoring system, i.e. the B-DETECTION PLUS i or s. If the continuous gas monitoring system B-DETECTION PLUS i or s indicates that the CO<sub>2</sub> level has fallen below the maximum standard value, the damper can be opened further using the lever on the B-AEROGUARD. This allows more air to flow directly into the compressor without passing through the filter cartridge, thereby significantly extending the cartridge service life.

**+300% cartridge service life possible!**

# UNCOMPROMISING AIR QUALITY MONITORING

The P-Purification systems integrated into the high-pressure compressor do an outstanding job of removing oil and moisture from the compressed air, with optional carbon monoxide (CO) removal. BAUER AERO-GUARD-OX efficiently removes CO<sub>2</sub> from the air after its oxygen content has been increased by the membranes. However, adverse environmental factors such as excessive CO or CO<sub>2</sub> levels may cause limit values to be exceeded if changing of the filter cartridge is inadvertently delayed. To combat this, BAUER developed the B-DETECTION PLUS gas measurement systems, which identify these situations and prevent contaminated air from being filled into the cylinders. Solid legal certainty is ensured by an integrated data logger with SD card functions for performing defined individual measurements. Measuring values can be logged at any time and accessed in Excel format.

## GAS MEASUREMENT TECHNOLOGY

### B-DETECTION PLUS m

Portable carry-case solution for rapid temporary measurement of O<sub>2</sub>, CO, CO<sub>2</sub> plus optional measurement of absolute moisture and total oil values (VOCs)<sup>1</sup> in breathing air cylinders, filling hoses and other high-pressure outlets.

The patented special design of the dewpoint sensor delivers an extra-rapid response for virtually instantaneous moisture measurement.

The sensors can be calibrated semi-automatically.



B-DETECTION PLUS m



B-DETECTION PLUS s

### B-DETECTION PLUS i and s

Compressor-integrated or standalone gas measurement solution for measuring O<sub>2</sub>, CO, CO<sub>2</sub> plus optional measurement of absolute moisture and total oil values (VOCs)<sup>1</sup>. If limit values are exceeded the control unit activates visual and acoustic alarm signals and shuts down the system before contaminated air can pass into the cylinders being filled.

With the new generation B-DETECTION PLUS, you can test not only the ambient air but, if desired, also measure the quality of the breathing air in the cylinder itself as well as in the intake hose.

- › **NEW!** Shorter response time during humidity measurement
- › **NEW!** Lower running costs through optimised calibration

<sup>1</sup> Oil measurement based only on volatile organic compounds (VOCs). Sensor calibration based on isobutene.

## THE IDEAL SOLUTION FOR EVERY SITUATION

BAUER's extensive range of accessories enables you to customize your system to your personal needs – with B-KOOL for cutting filter cartridge costs, B-SECURUS for monitoring cartridge saturation, or AERO-GUARD-OX for CO<sub>2</sub> absorption where ambient limits are exceeded.

### MOISTURE? NO CHANCE!

**The B-SECURUS system monitors the saturation level of the filter cartridge(s) by measuring residual moisture in the compressed air of the molecular sieve of the P-Purification system**

B-SECURUS displays the current filter cartridge status with an integrated “traffic light” warning light system and in the display of the B-CONTROL unit. An amber light indicates the cartridge needs to be changed soon. When the cartridge is fully saturated a red warning light is shown and the compressor shuts down. This effectively prevents the cartridge filter life from being exceeded. As an additional safety feature, the compressor does not power up if there is no filter cartridge in the cartridge housing.

B-SECURUS helps to save compressor operation costs by using filter capacity to the maximum.

The B-SECURUS system does not require calibration.



B-SECURUS: Uses a “traffic light” system to track remaining filter cartridge life

### CUTTING COSTS AND HELPING THE ENVIRONMENT

**The B-KOOL Refrigerant Dryer extends the life of filter cartridges many times over, offering huge potential for cutting costs and saving resources.**

B-KOOL uses refrigerant drying to lower the temperature of the warm compressed air before it passes into the final separator. This causes the oil and water vapour to condense in the separator before reaching the filter cartridge, multiplying the filter cartridge life. The warmer and moister the ambient conditions, the greater the potential savings, enabling purchase costs to be rapidly recouped.

By reducing cartridge consumption, B-KOOL also makes a major contribution to saving resources and avoiding waste.



B-KOOL III

## SAFE FILLING, MAXIMUM CONVENIENCE

**The BAUER B-FILL external filling panel – now with a stylish new design – allows you to quickly fill breathing air cylinders.**

The B-FILL is now modularly expandable and can even be retro-fitted. Each module is equipped with two filling connectors, as desired either with hoses or direct connections, both of which can fill at up to 200 or 300 or 420 bar.

For optional control and monitoring of the system, a B-CONTROL MICRO can be installed in an additional B-FILL module. Any number of B-FILL modules can be combined, allowing you to create the perfect filling panel for your requirements.



BAUER filling panel B-FILL

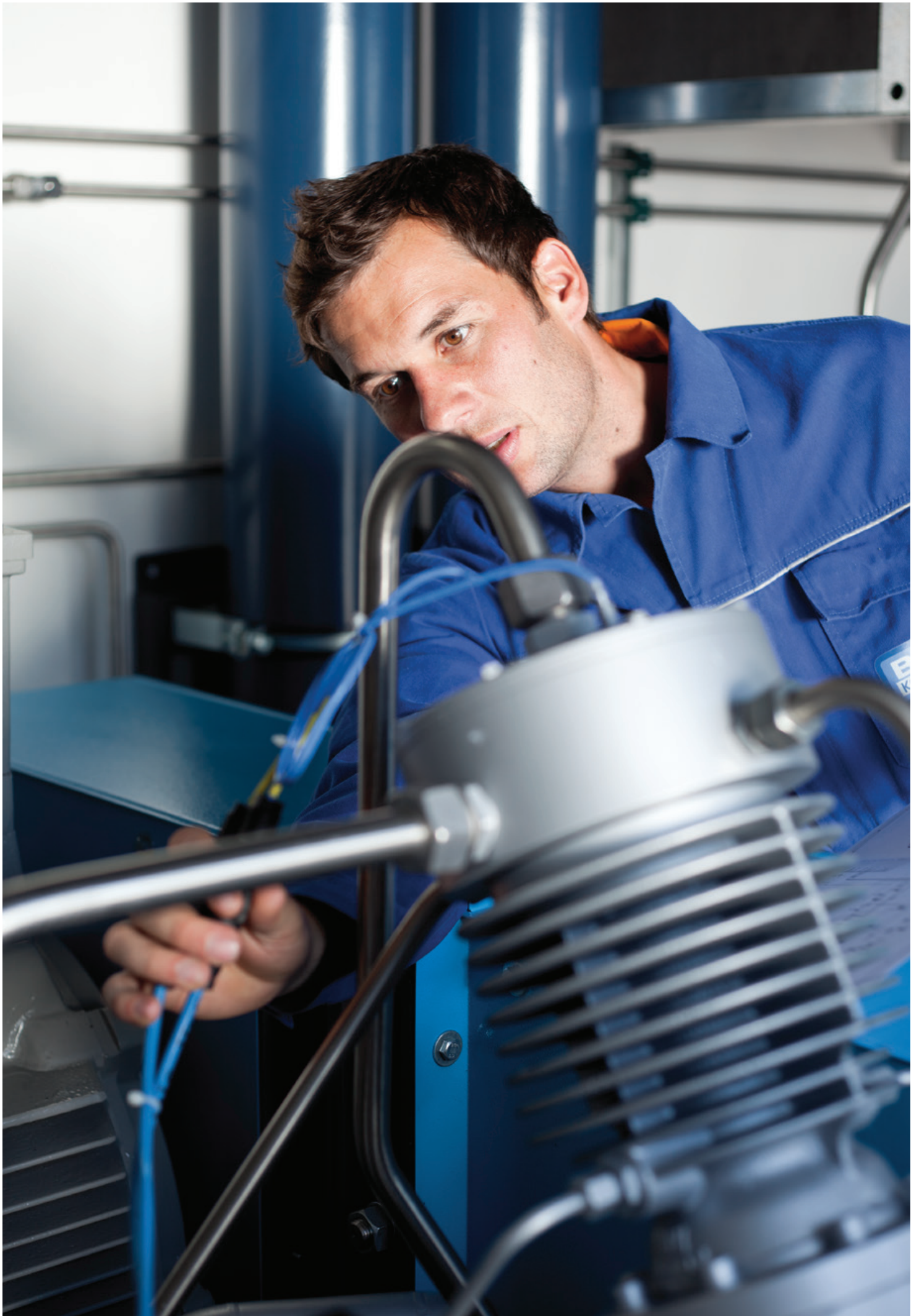
## PERFECT PROTECTION FROM EXPLODING CYLINDERS

**The B-SAFE-OX safety filling system offers enhanced protection of individuals and the compressor environment during filling.**

The rugged steel safety module provides protection from severed or detached filling hose connections and cylinder explosions during filling. The doors are automatically locked during filling.



B-SAFE 300 filling device



# ACCEPTANCE AND SERVICES

## MANUFACTURING IS ONLY PART OF WHAT WE DO:

### ISO 9001 CERTIFICATION

- › BAUER assures consistent maximum product quality by applying extensive quality control measures during and after production in line with DIN EN ISO 9001

### ACCEPTANCE TESTING

- › A factory acceptance test (FAT) or site acceptance test (SAT) in the presence of the customer or independent certifying body can be performed in addition to the standard BAUER final test. Many BAUER compressors can also be produced in compliance with other standards, e.g. ASME, KHK etc.

### PACKING AND PRESERVATION

- › Our compressors are packed ex works for transport by truck or air freight. We offer appropriate packing designs tailored for shipping, transport to tropical regions or long storage periods as well as short or long-term storage.

### INSTALLATION

- › Professional installation is a vital basic factor for safe operation of high-pressure systems. Our global network of branches and qualified partners provides smooth, trouble-free support in planning and implementation, wherever you are.

### PLACING INTO SERVICE

- › When installation is completed, BAUER's specialist staff check the compressor functions to ensure everything works smoothly. Placing into service naturally includes in-depth instruction for the operators, as a basis to ensure optimum use of the system in the future. This pays off in terms of lower operating costs and higher added value.

### TRAINING

- › To ensure your staff are always up-to-date, we provide a comprehensive range of practical training courses for our customers, where users and operators can benefit directly from our expertise.



**INTERESTED IN OUR  
PRODUCTS?**

**CONTACT US – WE ARE HAPPY TO PROVIDE  
INFORMATION AND ASSISTANCE.**

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