B-DETECTION PLUS –
THE NEXT GENERATION
MOBILE AND STATIONARY GAS MEASUREMENT SYSTEMS

BECAUSE "ROUGHLY" ISN'T IN YOUR VOCABULARY

Even when your compressor is operated and maintained in line with professional standards, critical conditions may cause breathing air to become contaminated with hazardous substances. The consequences may be serious, endangering health or even life. Breathing air thus requires continuous monitoring. The same applies to unreliable measurement of breathing air, for example when technically unsuitable sensors are used. BAUER tackled the problem by developing its own gas measurement system in-house. The new B-DETECTION PLUS Gas Measurement System is your reliable partner for measurement needs. It is available in three versions: B-DETECTION PLUS i (integrated into your compressor[1]),
the standalone B-DETECTION PLUS s and the mobile and portable B-DETECTION PLUS m.

Breathing Air Standard, DIN EN 12021:2014-07	
	Limit values
Oxygen (O_2)	21 % ± 1 %
Carbon monoxide (CO)	5 ppm
Carbon dioxide (CO_2)	500 ppm
Oil	0.5 mg/m³
H_2O[2]	25 mg/m³

WHY END-TO-END MONITORING OF BREATHING AIR IS VITAL

> Avoids accidents caused by excessive CO in breathing air cylinders

> Helps to mitigate environmental pollution from rising levels of CO_2

> Prevents freezing of scuba regulators and rust formation in the cylinder caused by excessive humidity of the compressed air

> Supports operators with respect to liability issues in case of accidents

> Protects own and others' health

1 Can be integrated into compressors from the new MINI-VERTICUS, VERTICUS and PE-VE series.
2 Moisture limit values measured directly downstream of compressor.

PURE AIR
BAUER KOMPRESSOREN
SAFE DIVING
GOLD CERTIFIED
★★★★★

PURE AIR
BAUER KOMPRESSOREN
SAFE FIREFIGHTING
GOLD CERTIFIED
★★★★★

The new certification standard of PureAir GOLD was introduced by BAUER to enable breathing air filling stations to demonstrate their compliance with the highest possible level of breathing air purity. Visitors to a diving centre, customers at a diving shop, or filling staff at a firefighting station with breathing air filling system can see at a glance that they can rely one hundred per cent on compliance with the strict specifications of the DIN EN 12021: 2014 Breathing Air Standard. This compliance is monitored by B-DETECTION PLUS i/s, the new online gas measurement system, which provides end-to-end screening of the compressed air.

To gain Gold certification, filling facilities must also meet the other PureAir certification conditions already in place:

❯ Correct location and position of the compressor system as described in the operating manual. Compliance with these regulations prevents problems such as contamination of intake air by carbon monoxide from the exhaust of a compressor combustion engine.

❯ Exclusive use of genuine BAUER filter cartridges. Cartridges must be produced under industrial conditions to guarantee consistent cartridge quality.

❯ Monitoring of cartridge life by an internal or retrofitted B-SECURUS filter monitoring system when a B-DETECTION PLUS system without humidity sensor is used.

❯ Annual inspection of the filling system by a BAUER PureAir authorized partner in accordance with DIN EN 12021:2014.

The PureAir Standard currently in operation will continue to apply as PureAir SILVER. All existing Silver stations can easily upgrade to the new PureAir GOLD Standard by retrofitting the B-DETECTION PLUS System.

UNCOMPROMISING SAFETY WITH END TO END CONTROL

RELIABLE AIR QUALITY CHECK

The new B-DETECTION PLUS Gas Measurement System monitors the quality of the breathing air produced by your system in compliance with the Breathing Air Standard, DIN EN 12021:2014. Automatic, continuous and ultra-reliable.

LEGAL CERTAINTY

When one or more limit values are exceeded, the compressor shuts down automatically[1]. The system also runs a LiveCheck of all sensors before powering up. These safeguards ensure that breathing air cylinders are filled with nothing but pure, clean air at all times. All measurement values can be logged using the B-CONTROL MICRO and exported to an SD card as Excel files. As the system operator, this provides you with a high level of legal certainty.

1. High-pressure compressor
2. B-DETECTION AIRBOX
3. Data cable
4. Gas hose
5. High-pressure piping
6. B-DETECTION PLUS s
7. External filling panel
8. B-DETECTION PLUS m
9. Breathing air cylinder

SMARTPHONE INTERACTION

The B-APP sends all current gas measurement data to your smartphone, enabling you to check the quality of breathing air going into your cylinders at all times.
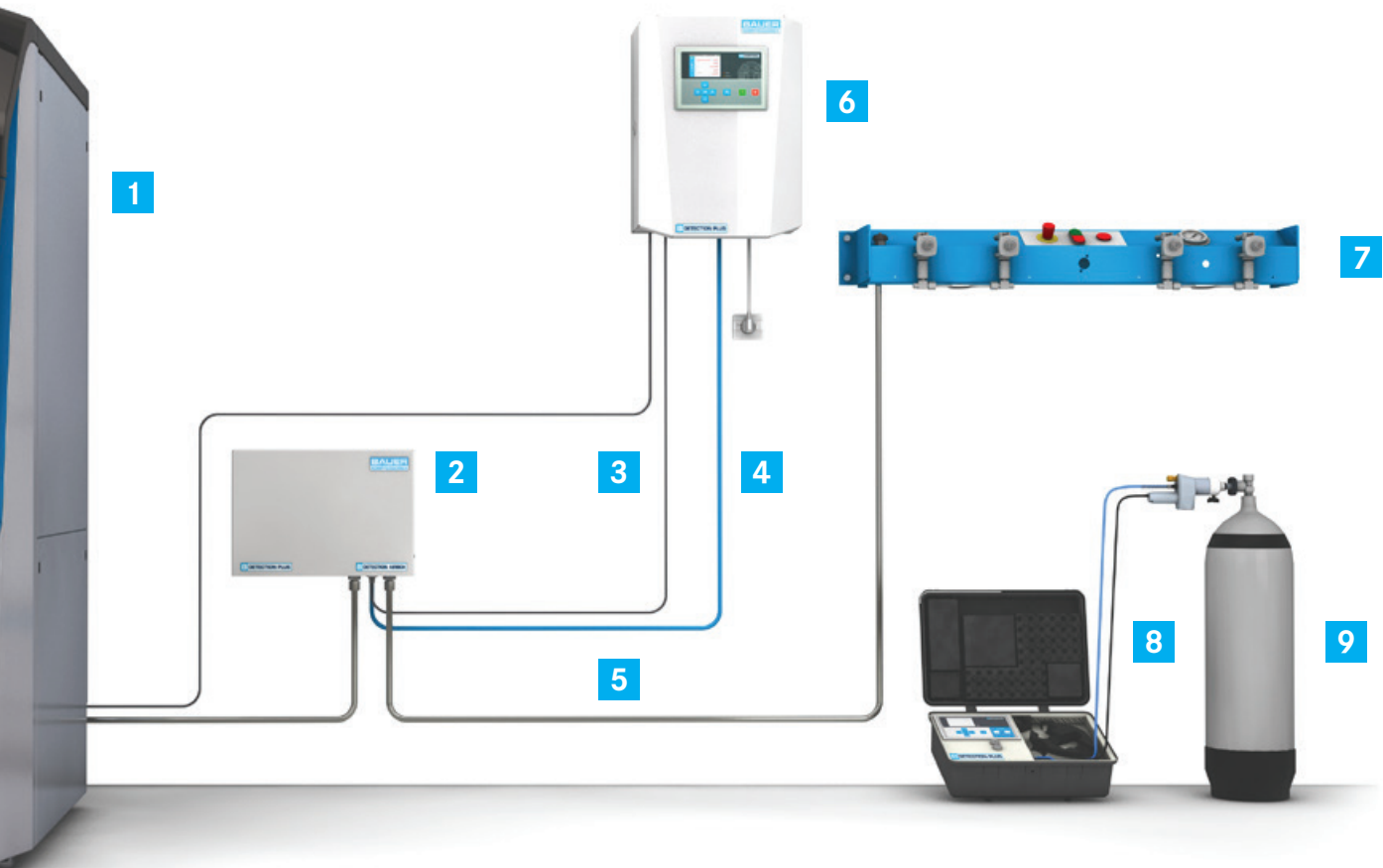
PLUG AND PLAY

Supplied fully integrated with your compressor system, or as a standalone version for retrofitting: the B-DETECTION AIRBOX includes a full range of all necessary accessories in a single unit for rapid, simple retrofitting to existing systems.[1]

SIMPLE SERVICE ACCESS

The integrated B-DETECTION PLUS i includes a connector for fast system testing, located under the front panel[1]. The front panel can be opened with a single movement to introduce the test gas through the connector provided.

MOBILE SAFETY

The mobile, portable B-DETECTION PLUS m can measure breathing air directly from the cylinder or filling station as well as ambient air. Powered by an (optional) rechargeable battery, it is ready for use anywhere and any time – no need for external power sources. The housing offers IP65-rated protection against dust and water jets, enabling the B-DETECTION PLUS m to be used even in the harshest weather conditions.

1 Only available on MINI-VERTICUS and VERTICUS units.

B-DETECTION PLUS

CONTINUOUS MONITORING OF YOUR BREATHING AIR QUALITY

Standalone version: B-DETECTION PLUS s

B-DETECTION PLUS Gas Measurement System monitors the quality of the breathing air you produce: measuring CO, CO_2, O_2 as standard and offering options for absolute humidity and residual oil (VOC)[1]. Automatic, continuous and ultra-reliable.

The B-CONTROL compressor control unit enables you to monitor compliance with the limit values of the DIN EN 12021:2014 Breathing Air Standard at all times[1]. 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.

Automatic shutdown if flow is blocked: To ensure continuous flow of air and guarantee correct measurement values, an integrated flow monitor automatically shuts down the compressor if the flow is interrupted or reduced, e.g. caused by piping kinks or blocked filter elements.

B-DETECTION PLUS I FOR INTEGRATION INTO COMPRESSOR SYSTEMS

If desired, B-DETECTION PLUS i can be integrated into your new VERTICUS, MINI-VERTICUS or PE-VE system with B-CONTROL MICRO or B-CONTROL II control unit at the factory. To ensure optimum operating conditions for the sensors and maximize service life, B-DETECTION i is installed in the cold air flow. Both the gas measurement system itself and the gas extraction unit that regulates the inlet pressure of the B-DETECTION PLUS are integrated into the compressor.

A single control unit for all components: So convenient – simply read off the current air quality values from your compressor control unit. You can also make any changes to your B-DETECTION PLUS settings there too.

B-DETECTION PLUS S FOR RETROFITTING AND FURTHER COMPRESSOR SYSTEMS

The new gas measurement system is also available as a standalone model, B-DETECTION PLUS s. Offering the same range of functions, it is designed for separate wall mounting and can be used with further BAUER systems or retrofitted to existing systems.

Air quality levels are displayed on the B-CONTROL MICRO control unit of the standalone gas measurement system, which can also log measurement values. The B-DETECTION PLUS s can also automatically shut down the compressor system if contamination levels rise. Measurement values can be transmitted to the control unit, depending on the model[1].

1 Absolute humidity and residual oil (VOC) monitoring optional. Residual oil measurement based only on volatile organic compounds (VOCs). Sensor calibration based on isobutene.

ADDITIONAL FEATURES

› Use of high-quality sensors with temperature compensation and additional pressure-compensated CO_2 sensor for extreme measurement precision

› **All measurement values are logged:** A data logger function enables all measurement values within a defined period to be exported as an Excel file using a SD card and clearly displayed using the BAUER Excel Macro.

OPTIONAL ACCESSORIES

› **New!** Immediate humidity measurement results can be delivered without waiting, even after long compressor idle periods. This is achieved by a patented special design with desiccant capsule which protects against ingress of ambient moisture.

› **New!** Mobile gas sampling unit: If you wish to test the gas quality in your breathing air cylinders as well as continuously testing the breathing air quality of your compressor system, our mobile gas sampling unit is the solution. It is suitable for retrofitting to existing systems.

› **Gas humidifier:** For systems in operation for more than one hour per day, the additional humidification hose is recommended to maximize the service life of the electrochemical sensors (CO, O_2).

› **Automatic purge valve:** In cases where limit values are briefly exceeded, an automatic flush valve (registered as a utility patent) discharges contaminated air to the outside without interrupting operation of the system. This is particularly recommended for fully automatic operation of the system to avoid unnecessary interruption to compressor operation.

› **Ambient air pump:** An additional pump installed in the measurement system enables the gas composition of the intake air to be analysed. Where the CO_2 content of the intake air is permanently at levels of 450 ppm or over, we recommending using an AERO- GUARD CO_2 Absorber.

› **B-APP:** The B-APP sends all current gas measurement data to your smartphone, allowing you to enabling you to check the quality of breathing air going into your cylinders at all times[1].

› **New! B-CLOUD:** Now you can also benefit from location-independent access to all your plant data[2]! Direct notifications via push messages in case of malfunctions as well as remote support of your service partner enable absolutely smooth operation.

B-DETECTION PLUS i, integrated into a BAUER VERTICUS system

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[1] Transmission of measurement values from the B-DETECTION PLUS s control unit to compressor control system is only possible for BAUER compressors with B-CONTROL MICRO compressor control unit with colour display.

[2] All data stored in B-CLOUD is located in a highly secure data center in Western Europe. B-CLOUD is DSGVO compliant and uses SSL encryption.
   Please note that B-CLOUD services are not available in all states.

B-DETECTION PLUS m

THE MOBILE SOLUTION FOR RELIABLE BREATHING AIR MEASUREMENT

B-DETECTION PLUS m is a compact, portable all-in-one solution that gives you the freedom to perform reliable breathing air measurement wherever and whenever you need to.

Like the stationary models, the B-DETECTION PLUS m delivers completely reliable, ultra-precise readings to monitor compliance with DIN EN 12021 limits for CO, CO_2, O_2 and – optionally – absolute humidity and total oil values (VOC)[1].

B-DETECTION PLUS m offers an array of measurement options. The gas sampling unit supplied as standard is used to measure air quality in breathing air cylinders. Optionally, measurement can also be performed directly at the compressor. As a further option, intake air can be measured before it enters the compressor.

The control unit allows a tailored measurement profile to be selected for measuring air directly from the compressor or air cylinder.

The transport case offers IP65-rated protection against dust and water jet ingress and withstands harsh environmental conditions. Sensors are rapidly and easily accessible, simplifying maintenance.

Solid legal certainty is ensured by an integrated data logger with SD card function for performing defined individual measurements.

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

The system offers fast venting to allow the gas sampling unit to be quickly detached from the air sampling connector.

If limit values are exceeded, the B-DETECTION PLUS m control unit activates visual alarm signals.

Mobile version:
B-DETECTION PLUS m

1 Absolute humidity and oil (VOC) monitoring optional. Oil measurement based only on volatile organic compounds (VOCs). Sensor calibrationt based on isobutene.

OPTIONAL ACCESSORIES

> **Battery operation:** The integrated rechargeable battery enables measurement to be performed independently of external power sources. Its capacity covers a minimum of 5 hours of measurement. The long-life lithium-iron polymer cell guarantees an extra- high number of charging cycles.

> **T-connector adapter:** Place our adapter between the filling hose and breathing air cylinder to measure air quality during the filling process. This eliminates unnecessary pressure loss in breathing air cylinders.

> **Filling hose adapter:** When connected to the system filling hose, enables air to be measured directly from the compressor.

> **Ambient air pump:** An additional pump installed in the measurement system enables the gas composition of the intake air to be analysed. Where the CO_2 content of the intake air is permanently at levels of 450 ppm or over, we recommending using an AERO- GUARD CO_2 Absorber.

> **B-CLOUD:** The B-CLOUD provides an overview of all operating data of your BAUER units with B-CONTROL MICRO control in real time. In case of warnings or malfunctions, the system sends you a push notification to your smartphone on request[1].

> **B-APP:** The new free B-APP sends all current gas measurement data to your smartphone, allowing you to check the quality of the breathing air going into your cylinders at any time[2].

Available in the App Store (iOS) and on GooglePlay (Android).
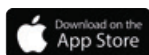
Gas sampling unit with optional dew point sensor

Display showing limit values in compliance with DIN EN 12021:2014

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1 All data stored in B-CLOUD is located in a highly secure data center in Western Europe. B-CLOUD is DSGVO compliant and uses SSL encryption.
  Please note that B-CLOUD services are not available in all states.

2 As a requirement, the B-CONTROL MICRO (+Net) compressor control unit must have a valid IP address and be connected to the same local area network (LAN/WLAN) as the smartphone.

OPTIMUM MAINTENANCE – HIGH-PRECISION MEASUREMENT

If an incident occurs, operators of filling systems must provide proof that only pure, clean air has been used in their filling operations. BAUER B-DETECTION PLUS Gas Measurement Systems conduct continuous and reliable measurements of all standard gases covered by the DIN EN 12021:2014 Breathing Air Standard. This provides users of breathing air with the maximum safety and certainty.

Cylinders are filled with pure air only, ensuring that divers, firefighters and other users are supplied with pure breathing air that complies with the regulations of DIN EN 12021:2014. However, to ensure this reliability is maintained, sensors must be tested every three months. BAUER supplies testing kits tailored to the needs of the user.

The Calibration and Test Gas Kit contains the basic set of all test and calibration gases for your B-DETECTION PLUS Gas Measurement System. It is designed for local operators seeking to test and calibrate their systems at regular intervals, and also for technicians and appropriately trained individuals tasked with replacing sensors.

The Test Gas Kit contains the basic set of all test gases for your B-DETECTION PLUS Gas Measurement System. It is designed for local operators seeking to test their systems at regular intervals.

Test gases are guaranteed to meet the highest quality standards. The gas blends are tailored precisely to the measurement sensor systems. They have a BAUER-guaranteed shelf life of two years from the manufacturing date. Every batch of products is tested using ultra-precise analysis processes and 100% documented.

BAUER gas blends are tailored precisely to the measurement sensor systems, providing the basis for highly accurate measurement results. The sensors of B-DETECTION systems must be tested at least every three months and can be calibrated as required.

Compressed gas cylinders can be shipped by sea or road. However, given the hazard class of gas cylinders, air transport might be prohibited (depending on the country group of the destination) or involves significant extra costs.

Please check the shipping terms before ordering (dangerous goods ID of 1-litre containers: UN2037).

Test gas kit

To ensure measurements are performed to the highest precision by the gas measurement system and lengthen the service life of the device, we recommend the following inspection intervals:

Inspection Types	Intervals
Function check	Before each use / Every 3 months
Calibration/sensor exchange CO, O_2	As required
Inspection records	Every 3 years

B-DETECTION CALIBRATION AND TEST GAS KITS: CONTENTS

CALIBRATION AND TEST GAS KIT, COMPLETE: 180907-KD[1]

Contents in detail	Number	Comments	Order number
Case	1x	For test/calibration gases, with inlay	N42895
Pressure reducer	1x	For gas cylinders for testing and calibration, 1 litre / 12 bar	N42334
Calibration gas	1x	12 litres / Calibration gas Low for CO, CO_2, VOC	N42328
Calibration gas	1x	12 litres / Calibration gas High for CO, CO_2, O_2	N42330
Test gas	1x	12 litres / Test gas for CO, CO_2, O_2 and High gas for VOC	N42332
Calibration gas	1x	12 litres / Calibration gas Low for O_2	N40706

TEST GAS KIT, SMALL: 181590-KD[1]

Contents in detail	Number	Comments	Order number
Case	1x	For test gases, with inlay	N40381
Test gas	2x	12 litres / test gas for CO, CO_2, O_2 and High Gas for VOC	N42332
Pressure reducer	1x	For gas cylinders for testing and calibration, 1 litre / 12 bar	N42334

TEST GAS KIT, LARGE: 181336-KD[1]

Contents in detail	Number	Comments	Order number
Case	1x	For test gases, with inlay	N42895
Test gas	4x	12 litres / test gas for CO, CO_2, O_2 and High Gas for VOC	N42332
Pressure reducer	1x	For gas cylinders for testing and calibration, 1 litre / 12 bar	N42334

TOOLS / AUXILIARIES LARGE BOTTLES

Tools / Auxiliaries large bottles	Order number
High calibration gas CO, CO_2 and O_2: 300 litre / 150bar @ 2 litre bottle	N43678
Low calibration gas (zero gas) CO, CO_2 and VOC: 300 litre / 150bar @ 2 litre bottle	N43677
Low calibration gas (zero gas) O_2: 300 litre / 150bar @ 2 litre bottle	N43680
Pressure regulator + PUR-hose 300 litre connection	N43809
Test gas CO, CO_2, O_2 and high calibration gas VOC, 300 litre / 150bar @ 2 litre bottle	N43679

1 Also available as single part without case

Dangerous goods ID of 1-litre containers: UN2037

TECHNICAL DATA

B-DETECTION PLUS		
	B-DETECTION PLUS i/s	B-DETECTION PLUS m
MEASUREMENT VALUES		
	Carbon dioxide (CO_2), carbon monoxide (CO), oxygen (O_2), absolute humidity[1], VOC[1]	Carbon dioxide (CO_2), carbon monoxide (CO), oxygen (O_2), absolute humidity[1], VOC[1]
MEASUREMENT METHOD		
CO_2	Nondispersive infrared spectroscopy (NDIR)	Nondispersive infrared spectroscopy (NDIR)
CO, O_2	electrochemical	electrochemical
Absolute humidity	Via dew point	Via dew point
VOC (oil)	Photoionization detector (PID)	Photoionization detector (PID)
MEASUREMENT VALUES AND MEASUREMENT ACCURACY[2]		
CO_2	0... 2,000 ppm ± 2.5 % Full scale	0... 2,000 ppm ± 2.5 % Full scale
CO	0 ... 25 ppm ± 2 % of measurement range final value	0 ... 25 ppm ± 2 % of measurement range final value
O_2	0 % ... 40 % O_2 ± 1 % of measurement range final value	0 % ... 40 % O_2 ± 1 % of measurement range final value
Dew point	-70 ...+60°C / 10 ... 40,000 ppm ± 2°C / 1 ppm + 20% of displayed value	-70 ...+60°C / 10 ... 40,000 ppm ± 2°C / 1 ppm + 20% of displayed value
VOC (oil)	0 ... 1 ppm (based on isobutene as calibration gas)	0 ... 1 ppm (based on isobutene as calibration gas)
TECHNICAL SPECIFICATIONS		
Permissible operating temperature	+5°C ... +45°C	+5°C ... +45°C
Operating voltage	integrated: 24 VDC; standalone: 100-250 VAC, 50/60 Hz	90 – 260 VAC, 50/60 Hz
Flow rate	1.0 ... 3.0 l/min	1.0 ... 3.0 l/min
Weight	integrated: 3 kg; standalone: 8.5 kg	8.0 kg (standard version), 9.3 kg (full version excluding adapter)
Dimensions H x W x D [mm] with access	integrated: 160 x 260 x 92; standalone: 462 x 354 x 184	464 x 366 x 180
Maximum system pressure	350 bar	Permissible operating pressure: 4 - 420 bar
Maximum permissable charging rate compressor	1,000 l/min[3]	–
SYSTEMTEST/CALIBRATION		
Visual and tightness test	Monthly	Monthly
Function check[4]	Min. 3-monthly	Min. 3-monthly
System check	Annually	Annually
Calibration	CO, CO_2, O_2, PID sensor: As required and after replacing sensor; dew point sensor: every 24 months	CO_2 and PID sensor: annually and after replacing sensor; dew point sensor: every 24 months

1 Optional extra
2 Accuracy valid at max. +/- 10 ° C deviation from calibration temperature.
3 Higher charging rate on request
4 Includes Test with calibration gas; kit with testing gas cylinders and pressure reducer (flow meter) available from BAUER KOMPRESSOREN

ARE YOU INTERESTED IN OUR PRODUCTS?

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

TÜV SÜD
ISO 9001