

# 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<sup>1</sup>), the standalone B-DETECTION PLUS s and the mobile and portable B-DETECTION PLUS m.

## 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<sub>2</sub>
- › 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

### Breathing Air Standard, DIN EN 12021:2014-07

|                                   | Limit values          |
|-----------------------------------|-----------------------|
| Oxygen (O <sub>2</sub> )          | 21 % ± 1 %            |
| Carbon monoxide (CO)              | 5 ppm                 |
| Carbon dioxide (CO <sub>2</sub> ) | 500 ppm               |
| Oil                               | 0.5 mg/m <sup>3</sup> |
| H <sub>2</sub> O <sup>2</sup>     | 25 mg/m <sup>3</sup>  |

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



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<sup>1</sup>. The system also runs a live check 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.



### 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.



### B-CLOUD REMOTE ACCESS

The B-CLOUD provides a real-time overview of all operating data of your BAUER systems with the B-CONTROL MICRO Management System. In the event of warnings or malfunctions, the system sends push notifications to your smartphone



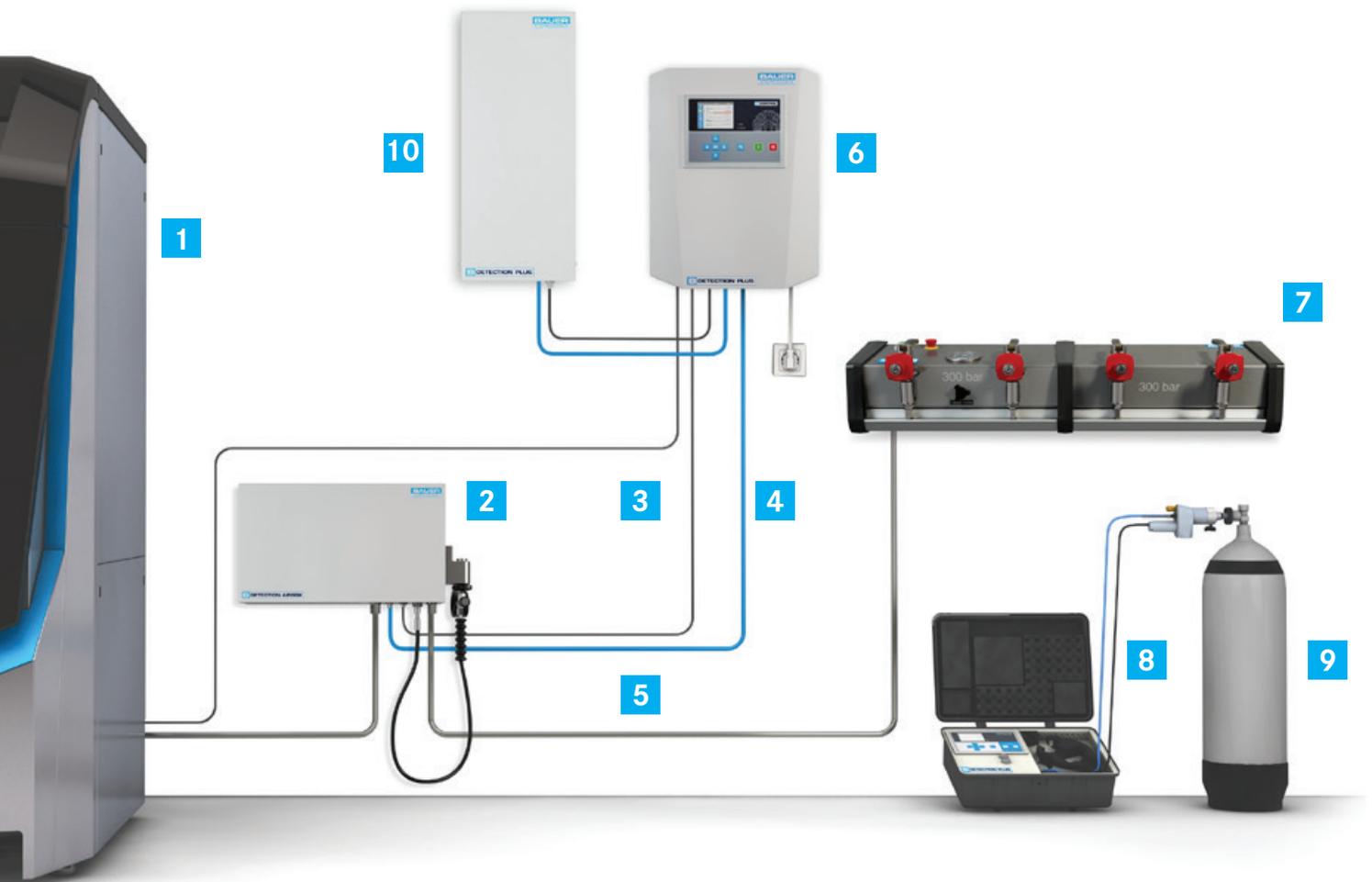
### PLUG AND PLAY

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.<sup>1</sup>

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
10. Automatic bump test



<sup>1</sup> Only available on stationary B-DETECTION i and s models with suitable system configuration.



## SIMPLE SERVICE ACCESS

The integrated B-DETECTION PLUS i includes a connector for fast system testing, located under the front panel<sup>1</sup>. 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.

<sup>1</sup> 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<sub>2</sub>, O<sub>2</sub> as standard and offering options for absolute humidity and residual oil (VOC)<sup>1</sup>. 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<sup>1</sup>. 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<sup>2</sup>. 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.

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

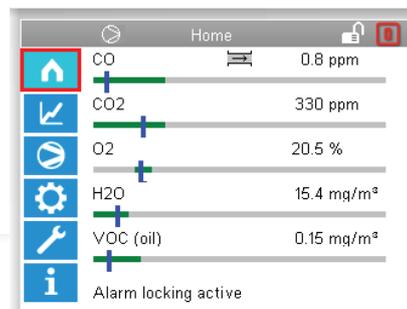
<sup>2</sup> Integrated B-DETECTION PLUS i systems cannot be retrofitted.

## ADDITIONAL FEATURES

- › Use of high-quality sensors with temperature compensation and additional pressure-compensated CO<sub>2</sub> 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 an SD card and clearly displayed using the BAUER Excel analysis tool.

## 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<sub>2</sub>).
- › **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<sub>2</sub> content of the intake air is permanently at levels of 450 ppm or over, we recommending using an AERO- GUARD CO<sub>2</sub> Adsorber.
- › **B-APP:** The B-APP sends all current gas measurement data to your smartphone, allowing you to check the quality of breathing air going into your cylinders at all times<sup>1</sup>.
- › **New! B-CLOUD:** Now you can also benefit from location-independent access to all your plant data<sup>2</sup>! 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

- › **Neu! More connection options:** The system's flexible and extensive range of applications is also reflected in new connection options. On request, an external alarm signal such as a horn or signal light can be connected. Integration into higher-level systems via data interfaces such as Modbus or Profibus is now also possible.

<sup>1</sup> 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.

<sup>2</sup> All data stored in B-CLOUD is located in a highly secure data center in Western Europe. B-CLOUD is GDPR 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<sub>2</sub>, O<sub>2</sub> and – optionally – absolute humidity and total oil values (VOC)<sup>1</sup>.

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

<sup>1</sup> Absolute humidity and oil (VOC) monitoring optional. Oil measurement based only on volatile organic compounds (VOCs). Sensor calibration 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<sub>2</sub> content of the intake air is permanently at levels of 450 ppm or over, we recommending using an AERO- GUARD CO<sub>2</sub> Adsorber.
- › **B-CLOUD:** The B-CLOUD provides an overview of all operating data of your BAUER units with B-CONTROL control in real time. In case of warnings or malfunctions, the system sends you a push notification to your smartphone on request<sup>1</sup>.
- › **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<sup>2</sup>.

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

<sup>1</sup> All data stored in B-CLOUD is located in a highly secure data center in Western Europe. B-CLOUD is GDPR compliant and uses SSL encryption.

Please note that B-CLOUD services are not available in all states.

<sup>2</sup> 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.

**New!**

## B-DETECTION PLUS – THE NEXT GENERATION

Smart improvements for greater safety, easier operation, additional applications and significant cost savings make the B-DETECTION PLUS gas detection systems even more attractive.



B-DETECTION AIRBOX with 450 bar purge valve

### EXPANDED APPLICATIONS

The new generation of B-DETECTION PLUS Gas Measurement Systems enables operation with options up to 450 bar final pressure. The newly-available purge valve in the B-DETECTION PLUS i and B-DETECTION PLUS s versions has been adapted for the larger pressure range.



B-DETECTION PLUS m/s/i bottle measurement system

### FLEXIBLE MEASUREMENTS

Until now, measuring the air quality of breathing air cylinders was reserved for the mobile B-DETECTION PLUS m model. With the new versions, the stationary models B-DETECTION PLUS i and s can also be equipped with the cylinder measurement option.

It is now also possible to measure intake and ambient air with all models.



## IMPROVED CALIBRATION

The next generation of B-DETECTION PLUS Gas Measurement Systems is able to calibrate all sensors semi-automatically in one run, which significantly reduces the amount of calibration gas required. This innovative optimization also makes it possible to adjust the sensors with just one calibration gas to ensure compliance with the EN 12021 breathing air standard at all times.

An automatic bump test is also available as an option, which automatically checks the accuracy of the sensors on a weekly basis.



B-DETECTION PLUS sensor box with automatic bump test



A look inside the B-DETECTION PLUS s sensor box

## SAFETY CONCEPT

The already impressive safety concept has been further optimized. Daily checks of the electrochemical carbon monoxide sensor ensure that potentially dangerous contamination cannot reach the breathing air cylinders unnoticed.

At the same time, the flow rate is monitored to ensure that all components are functioning properly so that measurements are always representative and precise.

**It has long been known that the most important component of equipment is breathing air. With the next generation of the B-DETECTION PLUS Gas Measurement System, BAUER KOMPRESSOREN once again demonstrates how seriously the the best breathing air quality is taken.**

## TECHNICAL DATA

| B-DETECTION PLUS   |   |  |
|--|---|--|
|  | B-DETECTION PLUS i/s  | B-DETECTION PLUS m   |
| <b>MEASUREMENT VALUES</b>                                      |   |  |
|  | Carbon dioxide (CO <sub>2</sub> ), carbon monoxide (CO), oxygen (O <sub>2</sub> ), absolute humidity <sup>1</sup> , VOC <sup>1</sup>  | Carbon dioxide (CO <sub>2</sub> ), carbon monoxide (CO), oxygen (O <sub>2</sub> ), absolute humidity <sup>1</sup> , VOC <sup>1</sup> |
| <b>MEASUREMENT METHOD</b>                                      |   |  |
| CO <sub>2</sub>  | Nondispersive infrared spectroscopy (NDIR)  | Nondispersive infrared spectroscopy (NDIR)   |
| CO, O <sub>2</sub>   | Electrochemical   | Electrochemical  |
| Absolute humidity  | Via dew point   | Via dew point  |
| VOC (oil)  | Photoionization detector (PID)  | Photoionization detector (PID)   |
| <b>MEASUREMENT VALUES AND MEASUREMENT ACCURACY<sup>2</sup></b> |   |  |
| CO <sub>2</sub>  | 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 <sub>2</sub>   | 0 % ... 40 % O <sub>2</sub> ± 1 % of measurement range final value  | 0 % ... 40 % O <sub>2</sub> ± 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)  |
| <b>TECHNICAL SPECIFICATIONS</b>                                |   |  |
| 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  | 0,5 ... 1,5 l/min; Dew point sensor: 2,0 ... 5,5 l/min  | 0,5 ... 1,5 l/min; Dew point sensor: 2,0 ... 5,5 l/min   |
| Weight   | Integrated: 2 kg; stand-alone without AIRBOX: 7.1 kg; AIRBOX (450 bar): 14 kg (19 kg); Test gas box (with cylinder): 6.9 kg (11.9 kg) | 8.0 kg (standard version), 9.3 kg (full version excluding adapter)   |
| Dimensions H x W x D [mm] with access                          | Integrated: 222 x 298 x 85 ; Stand-alone: 462 x 354 x 184   | 464 x 366 x 180  |
| Maximum system pressure  | Optional: 450 bar   | Permissible operating pressure: 4 - 420 bar  |
| Maximum permissible charging rate compressor <sup>3</sup>      | 850 l/min   | -  |
| <b>SYSTEMTEST/CALIBRATION</b>                                  |   |  |
| Visual and tightness test                                      | Monthly   | Monthly  |
| Function check <sup>4</sup>                                    | Min. 3-monthly  | Min. 3-monthly   |
| System check   | Annually  | Annually   |
| Calibration  | CO, CO <sub>2</sub> , O <sub>2</sub> , VOC sensor: As required and after replacing sensor; dew point sensor: every 24 months          | CO <sub>2</sub> 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.**

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**B-DETECTION PLUS EN**

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