



# BMair Protector

*The BMair Protector ensures complete operator safety in even the toughest dust conditions such as mining and quarry sites, fully measurable in real time and remotely accessible.*



**Full Compliance**



INTEGRATED MINING TECHNOLOGIES

# Every machine operator deserves clean air



BMair is dedicated to protecting what matters most: your employees. While the dangers of large, contaminated project sites are often recognized, significant health risks also exist inside the cabin, where operators may be unknowingly exposed to (micro) dust, such as silica, on a daily basis.

As the global market leader in protective ventilation systems, BMair provides high-quality, tailored solutions to address these hidden hazards across a wide range of industries, for machines operating in heavy, polluted environments. For more than 25 years, we have ensured that machine operators can work safely and in good health.

Our protective ventilation systems filter harmful substances from the air and create a safe working environment inside the cabin. This ensures that operators are protected against dust, fumes, gases, and vapors. We combine proven filter technology with intelligent monitoring, giving you continuous insight into air quality and system performance.



## How our systems work

BMair protective ventilation systems are mounted on the cabin or machine and operate as follows:

- 1 Air intake:** Outside air is drawn in.
- 2 Filtration:** Coarse dust is removed first, followed by fine dust through HEPA technology.
- 3 Protection:** Clean air is blown into the cabin with overpressure, preventing contaminated air from entering through cracks and holes.
- 4 Monitoring:** The system continuously checks filter status, overpressure, and air quality, and logs all this info.



# The benefits for your organization

## **Healthy and productive employees**

Operators who are not exposed to harmful substances every day experience fewer sick days, more energy, and greater motivation. Health is the foundation for higher productivity and job satisfaction. The chances of your employees developing a serious illness declines.

## **Always compliant**

Our systems help you comply with regulations such as MSHA, ISO 23875 and occupational safety guidelines. This way, you avoid fines, legal risks, financial and reputational damage.

## **More uptime, lower costs**

Protective ventilation systems prevent air conditioners from clogging with dust too quickly, avoiding expensive repairs and downtime. Use of our systems achieve on average 10% more uptime per machine, around 5 extra working days per year. This results in savings of approximately \$ 10,000 per machine per year.

## The invisible dangers in mining

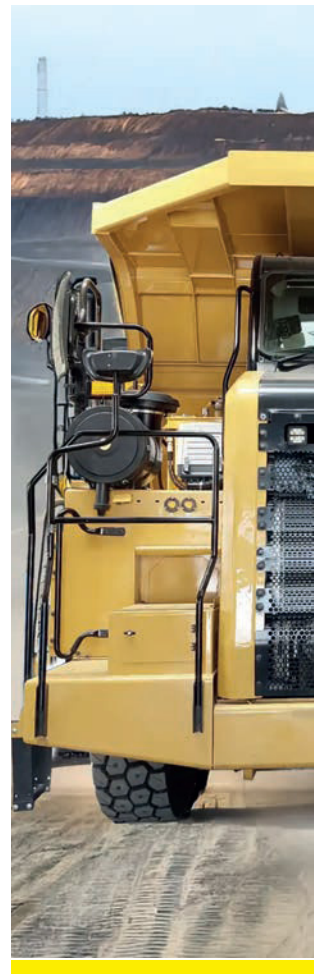
Every day, machine operators in mining environments are exposed to invisible but serious threats in the air. Fine dust, diesel emissions, and low oxygen levels can all have life-threatening consequences if left unchecked.

**Silica dust** is one of the most dangerous hazards. These ultra-fine, nearly invisible particles can penetrate deep into the lungs, where they cause irreversible damage such as pulmonary fibrosis (brown lung disease) and even lung cancer.

**Diesel motor emissions (DME)** from heavy equipment add another layer of risk. The exhaust contains ultra-fine soot particles and toxic compounds that are proven to be carcinogenic. Even at low concentrations, long-term exposure can cause lasting harm.

And underground, a silent threat lurks: **oxygen deficiency**. Poor ventilation can quickly reduce oxygen levels, leading to dizziness, unconsciousness, and, without rapid intervention, even death within minutes.

The reality is clear: mine operators breathe in danger every day. The BMair systems ensure they breathe clean, safe air instead, Automatically, continuously, and fully compliant with MSHA and ISO 23875 safety standards.





# BMair Protector

## Specifically designed for dusty environments

The BMair Protector is as compact as possible, without compromising functionality. The protective ventilation system, made of polypropylene, fiberglass, and stainless steel, contains unique components specifically designed to create overpressure. A crucial element, the fan, has been carefully calculated, tested, and developed in-house to achieve the optimal balance between flow, pressure, and motor power. The result: improved stability of pressure and flow compared to existing systems.



### BMair Protector

- Weight: 9 kg incl. filters
- Dimensions: 596 x 280 x 247 mm (L x W x H)
- Material: Stainless steel / Polypropylene
- Type filtration: Dust (such as silica, asbestos)
- Mounting: Everywhere on machine, both horizontally and vertically

The BMair Protector stands out for its effectiveness and efficiency, thanks in part to the HEPA-13 filter class. The filter has an efficiency of  $\geq 99.95\%$  at the most penetrating particle size ( $0.1-0.3 \mu\text{m}$ ), tested according to ISO 29463. The filters are housed in a robust polypropylene casing, minimizing direct contact with silica while replacing filters.

The filter is unique thanks to its patented RFID technology. This smart system allows the in-cab controller to instantly recognize which type of filter is installed. A digital logbook is automatically maintained without any manual input. The filter's lifespan is continuously monitored and the operator is alerted when it is nearly time for a replacement. No surprises. No unnecessary downtime.



HEPA-13 Filter with unique RFID technology



### Suitable for following machines:





# BMair Connect

## Smart control system with remote monitoring capabilities

The BMair Connect brings cabin safety to the next level. The control unit is installed inside the cabin where it continuously monitors air quality pressure levels and filter performance. Operators can instantly see whether the environment is safe at a glance.

BMair Connect and Protector starts up automatically. This means the cabin immediately reaches the standard 50 Pa overpressure. The system does not simply run at full power. Instead the controller automatically regulates the pressure ensuring optimal comfort for the operator both in terms of air pressure and noise levels inside the cabin.



### 4G Connectivity

Always connected anytime anywhere and without monthly fees. BMair Connect comes standard with a 4G data card for global connectivity.



### Data logging

Key data such as cabin pressure and air quality is automatically stored. Easily exportable into clear and professional compliance reports.



### Multilanguage

The controller can be set to multiple languages ensuring there is never any confusion about potential alerts or alarms on the BMair Connect.



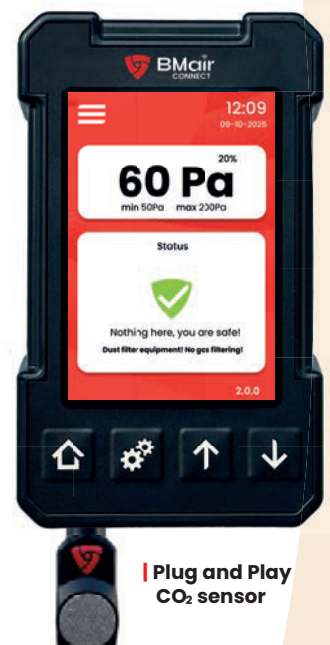
### Alerts & Alarms

Automatic alarms are triggered whenever danger arises with both acoustic and visual signals ensuring the operator is never caught off guard.

## Stay alert and focused with intelligent CO<sub>2</sub> monitoring

In mining it is essential to keep the air inside the cabin oxygen-rich keeping the operator alert and focused. To monitor CO<sub>2</sub> levels a plug-and-play sensor can easily be connected to the controller. When first activated on-site BMair Connect can perform automatically an initial measurement allowing the controller to detect ambient CO<sub>2</sub> levels in the working environment and automatically set high and low alarm thresholds.

This process is fully automated by BMair Connect. If CO<sub>2</sub> reaches one of the alarm thresholds the controller will automatically increase the airflow in the cabin. The flow intensifies but the operator will barely notice any change.



# BMair Airhub

## Intelligent expansion that goes beyond compliance

During operation the operator is protected against fine dust inside the cabin thanks to the performance of the BMair Protector. However dust may still enter the cabin for example when opening the door in a contaminated environment. To ensure compliance with fine dust limits in mining the BMair AirHub is installed inside the cabin.

The AirHub is equipped with an advanced particle sensor that continuously monitors dust levels in the cabin in real time. All data is instantly visible in BMair Connect, providing full transparency at a glance.

When dust levels rise above  $50 \mu\text{g}/\text{m}^3$ , the AirHub automatically increases the airflow to reduce the concentration back below the safety limit within just 120 seconds. This rapid response goes beyond the requirements of the ISO 23875 standard, offering operators an extra layer of protection. The operator does not need to take any action as the entire process is fully automatic, ensuring a clean and safe cabin environment at all times



## Control over cabin safety and compliance

The BMair Connect communicates with the BMair Connect Portal which is accessible 24/7 through your web browser.

### Real-time insight, anytime

- Monitor cabin overpressure and air quality 24/7
- Instant overview of your entire fleet

### Effortless compliance

- Complete event logging: see exactly who did what, and when
- Audit-ready reports instantly available and downloadable as PDF
- Fully prepared for increasingly strict safety standards (including ISO 23875)

### Full transparency & reduced costs

- Get alerts about filter replacement in advance: no surprise downtime
- No more manual reporting or incomplete logbooks
- Online maintenance reports available for fleet managers and compliance officers



# Full compliance starts here

## Meet (inter)national regulations



When the three packages are combined with the expertise of a certified BMair service partner, full compliance is guaranteed. Our partners have the right tools to certify your machine according to international standards such as ISO 23875. With this certification and real-time online access for monitoring and reporting, you gain full transparency and are compliant from the very first minute.

### Protector package

PKG-PROT-24V

1

- ✓ BMair Protector
- ✓ BMair Connect controller
- ✓ Free portal access



### HEPA Filter package

CX-PROT-PH

2

- ✓ Particulate Filter
- ✓ HEPA 13 Filter



### Mining package

PKG-MINING

3

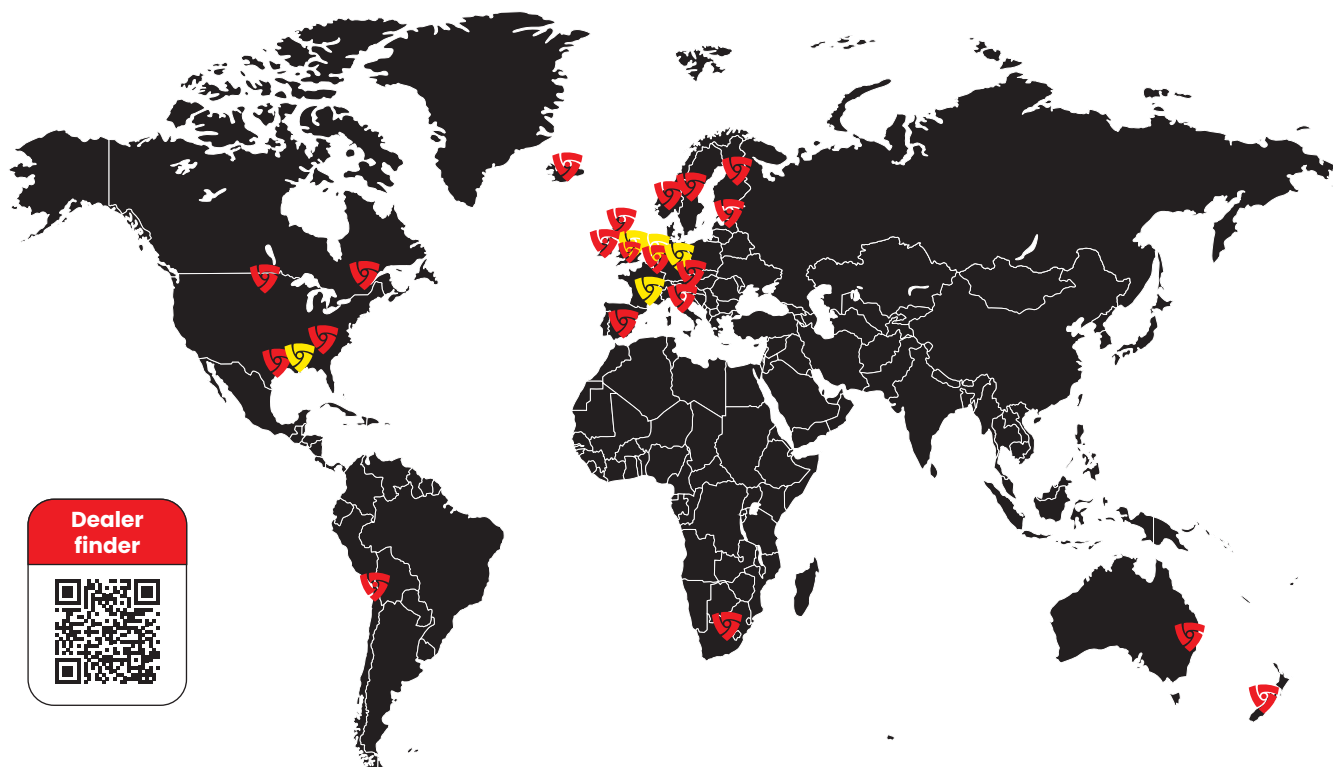
- ✓ BMair AirHub
- ✓ Intelligent CO<sub>2</sub> sensor
- ✓ Connect cabin adapter



## Find your BMair dealer

**Together with all our dealers, BMair fights unhealthy air worldwide!**

Together with our certified dealers worldwide, BMair stands by your side in the fight unhealthy air. Always up to date, always ready to advise and install the protective ventilation system that fits your needs best.



Dealer  
finder



# We fight unhealthy air

For over 25 years, our goal has been to provide them with the cleanest air possible at all times, every minute and every second of their workday. We never compromise when it comes to breathing air; after all, it is our human right.

The integrity of us as an organisation depends on the quality of our products. Therefore, it is of the utmost importance that our protective ventilation systems are of the highest standard. Only then can we achieve our goals: "the cleanest air possible for every machine operator who works in a polluted (mobile) work environment".

As the market leader in the protective ventilation systems market, we are getting closer to our objective every day. Many operators are already working with our protective ventilation systems.

Yet, there is still a long way to go. Too many employers, commissioning parties and machine operators can be light-hearted about the long term health risks. A good protection should be common practice.



**BMair**



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