# HVAC systems purpose-built for underground

Booyco Engineering designs and manufactures purpose-engineered HVAC and climate control systems to withstand the extreme heat, dust, humidity and long operating hours of underground mining, ensuring operator safety, regulatory compliance and reliable vehicle performance.

***Booyco Engineering's underground HVAC units are engineered for a wide range of mining vehicles, from personnel carriers to heavy production machines.***

Underground mining remains one of the toughest operating environments in the world, placing extreme demands on both personnel and equipment. Heat, dust, humidity, and long operating hours all contribute to conditions that require robust, purpose-built climate-control solutions. For more than four decades, Booyco Engineering has led the field in specialised HVAC and climate control systems engineered specifically for underground mining vehicles.

Proven in global applications, including 20-hour duty cycles in high-heat Indian mines, these robust systems provide clean, cooled, pressurised air across a wide range of underground vehicle types, supporting productivity and operational continuity.

With extensive experience across South Africa and global mining markets, Booyco Engineering designs and manufactures HVAC systems that ensure operator safety, equipment reliability and compliance with stringent mine health regulations. These systems are proven to withstand high dust loads, corrosive atmospheres, constant vibration, tight installation spaces and extreme thermal conditions.

Booyco Engineering's underground HVAC units are available in a range of duty ratings to suit diverse vehicle categories, including personnel carriers, utility vehicles, LHDs, rock drills, scalers and telescopic handlers. Systems typically deliver cooling capacities of 5.5-12 kW in +46°C ambient conditions, depending on the application, while maintaining positive cab pressure and clean-air delivery through specialised cyclonic dust-scavenging filtration and robust airflow designs.

A recent international application highlights the durability and reliability of Booyco Engineering's technology. In a large underground mining operation in India, a low-profile 30-man personnel carrier equipped with a Booyco climate control system operates up to 20 hours per day in high-heat, high-humidity conditions.

Running continuously at this decline shaft operation, the personnel carrier transports crews to and from the working areas. Also, it serves as an underground recuperation chamber, allowing personnel to recover from severe ambient temperatures. The HVAC system maintains safe air quality and comfortable temperatures despite the extreme duty cycle.

Central to the performance of Booyco Engineering's underground systems is the integration of dual-system designs and purpose-engineered filtration. Units are equipped with high-efficiency Sy-Klone filtration systems that remove airborne dust and other contaminants before they reach the operator's breathing zone. This ensures the air inside the cab remains within mandated occupational exposure limits, a critical requirement in hot, dusty and gas-laden environments.

The rugged construction of Booyco Engineering's HVAC units includes corrosion-protected materials, reinforced housings, sealed electrical components and vibration-resistant mounting systems. Intelligent control interfaces enable operators to adjust airflow and temperature to maintain safe, productive conditions. In addition, the systems are designed for ease of maintenance with accessible components and service intervals suited to intensive underground schedules.

"With the harsh realities of underground mining, climate control is far more than a comfort feature; it is a vital part of occupational health compliance and operational continuity," Brenton Spies, Managing Director of Booyco Engineering, says. "Our HVAC and climate control systems are engineered to keep operators safe and equipment running, no matter how demanding the conditions."

Across Africa, India, and other global mining regions, Booyco Engineering continues to set the benchmark in purpose-designed underground HVAC and climate-control technology. From personnel carriers to heavy utility machines, its solutions ensure mines can maintain safe working environments while improving productivity and reducing equipment downtime.

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***In a demanding underground mine in India, Booyco Engineering's HVAC system operates up to 20 hours a day in high heat and humidity.***