

Optimised motors for maximum efficiency

According to BMG electromechanical specialist Graeme Neilson, the electric motor is known as the workhorse in the mining industry and plays a critical role in ensuring optimum productivity at every plant. But a major problem associated with electric motors is that they are mostly not optimised for maximum efficiency.

“It is estimated that almost two thirds of the power consumed by the mining sector is associated with electric motors, particularly those used for pumps, fans and conveyors,” says Graeme Neilson, business unit manager for electric motors at BMG. “This is a concern for the mining sector – particularly at a time when the country’s power crisis is deepening.

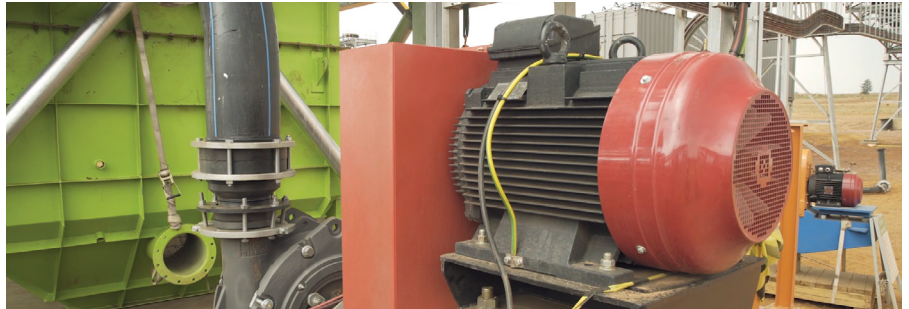
“At BMG, we work closely with our customers to meet their needs for continuous operation and high productivity in arduous mining conditions through the development of energy efficient electric motors. Our team of electric motor designers and engineers has collaborated with global electric motor specialists to develop Synergy IE3 electric motors that meet stringent quality standards and set the benchmark locally for arduous duty, high efficiency motors.

“Apart from critical energy saving features, BMG’s Synergy IE3 motors have important advantages over other electric motors on the market. These benefits include lower cost of operation, suitability for voltage variation applications, reduced temperature rise and minimal maintenance requirements. Synergy motors also offer greater reliability, reduced noise and vibration levels, more flexibility and longer service life.

“The BMG range of Synergy IE3 motors – developed specially for harsh mining conditions in Africa – have standard features that include IP66 protection against dust and water ingress and Class H insulation, with a Class B temperature rise. This means that the insulation can handle much greater heat than the motor’s operating temperature at full load. An important performance feature is that Synergy motors are most efficient when running between 75% and 100% of full load.

“These motors have a rated voltage of 400 V and 525 V and rated frequency of 50 Hz. The efficiency and power factor values make these motors cost-effective, offering an investment return in efficiency gains of between three and five years,” says Neilson.

An electronic soft starter – which controls parameters such as current and voltage – en-



The Synergy range is ideal for use in many industries, including mining and metallurgy, pumps and water treatment, petroleum, chemical, cement and sugar and paper milling.

sure the starting sequence is efficiently managed. Standard motors operate at fixed speed, regardless of the actual output required, while Synergy motors can operate efficiently, without cogging at low speed, in conjunction with a variable speed drive (VSD) to reduce energy consumption by over 50%.

VSDs are designed to manipulate power from a constant 3-phase 50/60 Hz supply, converting it to variable frequency. This enables the speed of the motor to be controlled to achieve maximum efficiency at the required load.

Synergy IE3 motors have been surface treated to ensure extended service life in

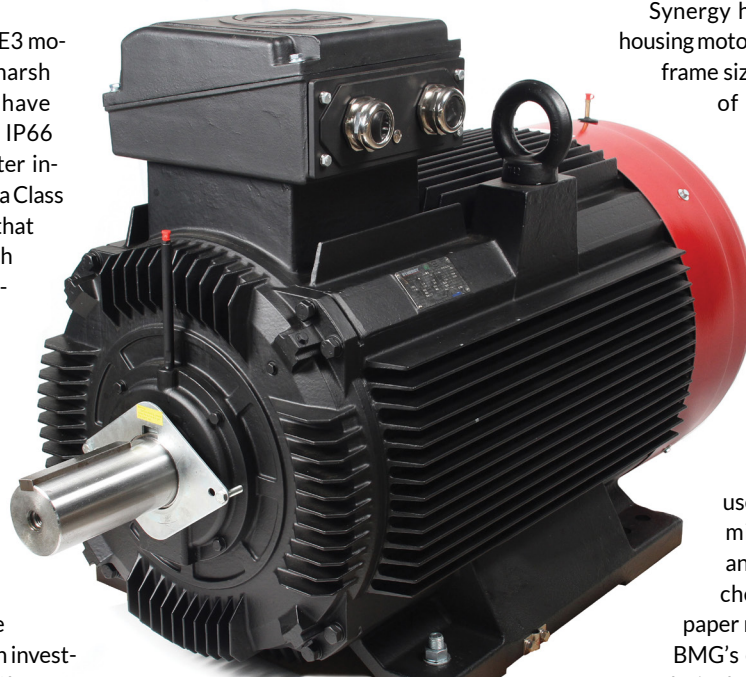
harsh mining conditions. For maximum flexibility during installation, both integrated and removable feet are available. Solid motor feet provide a more resistant structure against vibration, while removing the feet enables the motor to be placed in different positions on the motor frame. The latest design also allows the terminal box to be mounted top, right or left and the cable entry to be rotated by 360°, without disassembling the motor. This minimises modification time and reduces stockholding.

On these critical assets, BMG specialists recommend installing an SPM bearing monitoring device for continuous monitoring of the bearing condition.

Synergy has also developed aluminium housing motors, with cast iron end shields, for frame sizes from 56 to 180. Advantages of this design include a robust structure and reduced noise.

While BMG offers a full range of Synergy IE3 motors ex stock, it can also supply IE4 and IE5 units from the factory to meet specific requirements on every mine. All Synergy 3-phase asynchronous cast iron motors encompass the latest technology in electric motor design and are used in many industries, including mining and metallurgy, pumps and water treatment, petroleum, chemical, cement and sugar and paper milling.

BMG’s electromechanical team offers a technical advisory and support service throughout the entire Southern African region.



BMG’s designers and engineers have collaborated with global electric motor specialists to develop the Synergy IE3 range of arduous duty, high efficiency electric motors.

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