



SCRAPER WINCH MOTOR DESIGNED FOR SOUTH AFRICAN MINING CONDITIONS

Marthinusen & Coutts (M&C) is on the eve of launching its locally manufactured 55 kW 6 pole 525 (550) Volt scraper winch motor which has been specifically designed to meet the operating conditions in the South African mining industry.

Thousands of such winch motors are currently in use at local mines but procurement pressures over the years have resulted in the quality of winch motors decreasing to the point where the motor MTBF (Mean Time Between Failures) is very short for new winches and subsequent repair costs are very high. This is exacerbated because many companies have historically used low volume manufacturing techniques to produce these motors resulting in less than satisfactory quality and performance.

However, M&C identified the opportunity to design and manufacture a quality, competitively priced winch motor based on the increasing cost of electricity, the high installed base, Eskom's demand on consumers to reduce energy consumption and the limited investment into local high volume manufacturing of these motors.

Designated the MAC-200 premium winch motor, the new motor has been under development for 18 months with several prototypes having been built and tested.

Henk de Swart, the company's engineering director, says M&C has had wide exposure to repairing electric winch motors and improving the performance of such motors used in the South African mining industry.

"We have a major advantage because we have repaired these motors for many years and thus we have an intimate knowledge of what works and what doesn't.

Repairs are undertaken at our Rustenburg facility which is the largest dedicated low voltage repair facility in Africa."

"An example of where we reduced total cost of ownership (TCO) is at Anglo Coal, where in 2007 we reduced repair and purchasing costs by more than 50%



over four years, and this included capital costs. Motor uptime also increased three fold during that period.”

De Swart says parameters taken into consideration for local manufacture included the need to design specifically for South African operating conditions, the use of South African materials and labour as far as possible; all of which puts money back into the local economy.

“The MAC-200 winch motor has been engineered with TCO in mind. We have covered all bases. The motor complies with the required specifications for all mines and there has been no compromise in terms of quality, performance or efficiency. Verified full load test results are available.”

“In fact, in collaboration with mining houses we are currently undertaking plant tests to quantify the improved performance and TCO of these motors.”

“The design has been optimised to allow mass production to ensure that the product is brought to market at a competitive, acceptable price without compromising quality.”

De Swart indicates that M&C has made a significant investment in mass production in order to meet the anticipated demand and to sustain production levels.

“An investment of more than R2-million has been made in specialised equipment such as a CNC lathe machine and a CNC machine centre. A progression tooling lamination punching facility will be completed by August 2012.”

The MAC-200 winch motor offers premium performance with an output power of 55 kW, current of 78.4 A and speed of 987 rpm. Energy efficiency is 93.5 %, complying with the SANS (IEC) 60034-30 requirement for IE2 high efficiency motors. Temperature rise by resistance method is 64.1 C, which exceeds the SANS (IEC) 60034-2 requirements by 15.9 C.

The lock rotor current and torque complies with the SANS (IEC) 60034-2 as well as all mining house specifications. This performance was achieved by the use of

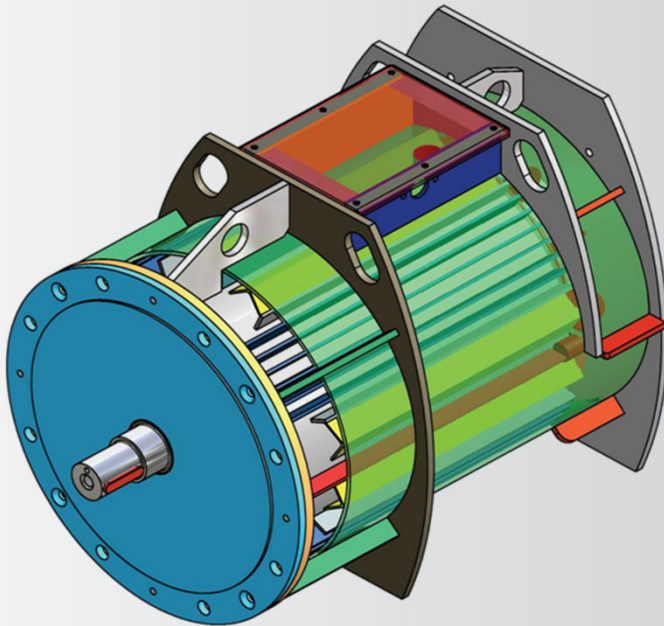


premium quality laminations for both the rotor and stator, thus reducing core losses and facilitating repair and increasing efficiency.

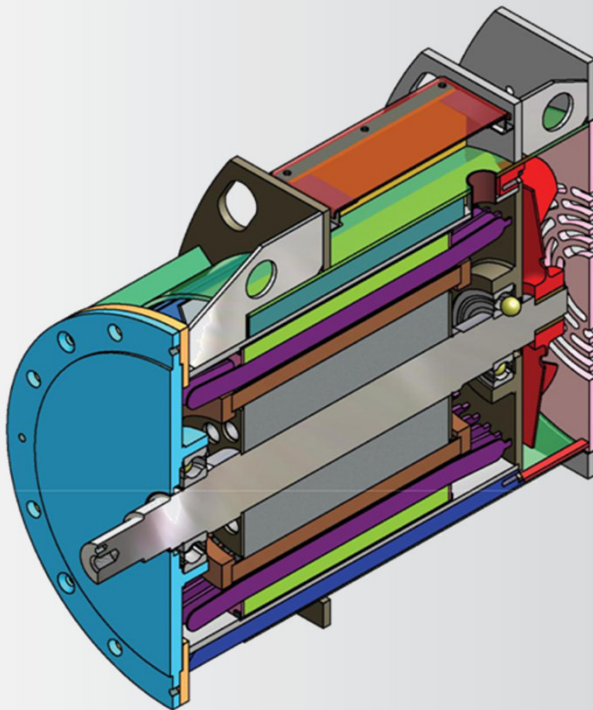
M&C has opted for robust mechanical design, considered a necessity to cope with the harsh operating conditions underground. Material used in the design was specifically selected with operational conditions in mind. Although the material used for the frame is thicker than the industry norm, the design took into account the logistical requirements of moving the motors around underground by including practical but aesthetically pleasing lifting points on the winch motor. In addition, the frame has been strengthened to accommodate the motor being rolled on uneven terrain in development ends.

Premium shaft material has been used to provide the superior mechanical strength while optimised cooling circuit design has resulted in a temperature rise margin of 15.9 C to specification as well as improved motor efficiency.

The motor design also incorporates an improved sealing arrangement to reduce the risk of contamination and ensure optimum performance and reliability in the high dust and moisture environments in which the motors operate.



An illustration of the 55 kW, 6 pole, 525 V premium efficiency winch motor developed by Marthinusen & Coutts

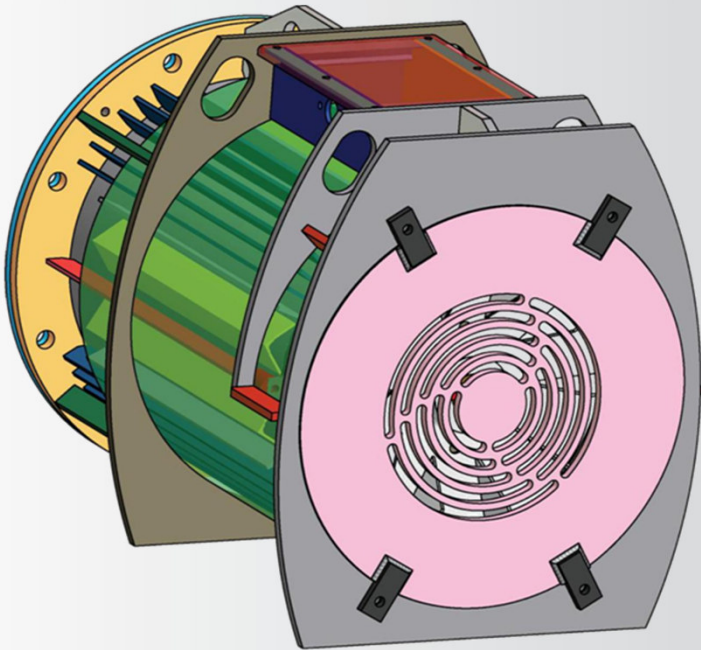


A cut-away illustration of the premium efficiency winch motor available from Marthinusen & Coutts



Marthinusen & Coutts

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Premium quality lamination steel was used for the rotor and stator of the winch motor developed by Marthinusen & Coutts

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