Focused on lower lifting costs, operators are looking for new ways to increase electrical submersible pumping (ESP) system efficiency. One way to achieve greater efficiency is by reducing energy consumption. Traditional ESP motor energy consumption accounts for up to 30% of ESP system efficiency losses. This is a critical issue in mature fields with declining production rates where operators are challenged to improve or maintain economics, or areas where operators are penalized/rewarded based on their power usage.

Do more with less

Baker Hughes, a GE company (BHGE), can help overcome these challenges with its Magnefficient™ permanent magnet motor (PMM), which significantly improves efficiency by lowering ESP system energy consumption, allowing operators to do more with less. This technology eliminates induction losses, lowering system power consumption by 20% and reducing motor power loss by 50%. With lower idle amps, the PMM enables better control at lower loads than traditional induction motors.

The PMM also delivers a higher power density, enabling operators to achieve a higher horsepower with the same motor, or the same horsepower with a smaller motor. With more power per length, operators are able to eliminate the need for tandem connections, which improves reliability and allows for quicker installation, saving additional time and cost. This also enables the ESP system to be set deeper in the well, closer to producing zones for maximum production in deviated wellbores.

Additionally, the Magnefficient PMM maintains a more constant power factor and efficiency rating over a larger load range compared to induction motor technology. This helps reduce cable power losses, or when applicable, allows the operator to use a smaller cable to save additional costs.

Applications
- Mature fields
- Conventional and unconventional wells

Benefits
- Lowers system power consumption by 20%
- Reduces motor power loss up to 67%
- Improves reliability by eliminating the need for tandem motor connections
- Enables quicker installation with shorter system, reducing NPT and costs
- Expands operational flexibility by getting closer to producing zones in deviated wellbores
- Reduces cable power losses by 25%
- Delivers superior reliability with rigorous design process and quality assurance
- Offers first-class operational excellence with industry-leading supply chain and technical support

bhge.com
Backed by superior reliability

While the efficiency gains are impressive, it is not possible to deliver successful results without ensuring the highest level of reliability. This requires a rigorous design process to build a high quality product, as well as operational excellence when deployed in the field.

BHGE leveraged learnings from other GE businesses to develop the Magnefficient PMM, including GE Aviation for the rotor design, and GE Healthcare for magnet research. The R&D team used advanced optimization algorithms to evaluate the design based on efficiency, power factor, and power density, while making sure those design elements did not violate temperature limits, rotor dynamics stability, or material structural capabilities. The Magnefficient PMM shares many of the same basic components as BHGE’s industry-leading induction motors, to sustain the same level of quality and reliability.

Operational excellence and execution is also critical when deploying new technologies. BHGE has the required global infrastructure to offer local support centers, technical expertise, and proper HSE protocols to reliably and safely deploy, service, and provide ongoing support for operators.

To learn how the Magnefficient permanent magnet motor can help you achieve increased efficiency while ensuring reliable operations, contact your BHGE representative or visit bhge.com/Magnefficient.

<table>
<thead>
<tr>
<th>Specifications</th>
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<tbody>
<tr>
<td>Outside diameter</td>
<td>3.75 in. / 95 mm</td>
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<tr>
<td>Maximum power</td>
<td>205 hp / 153 kW</td>
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<td>Power factor</td>
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<tr>
<td>Efficiency</td>
<td>92%</td>
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<td>Rated winding temperature</td>
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<td>Nominal rpm</td>
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<td>Poles</td>
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