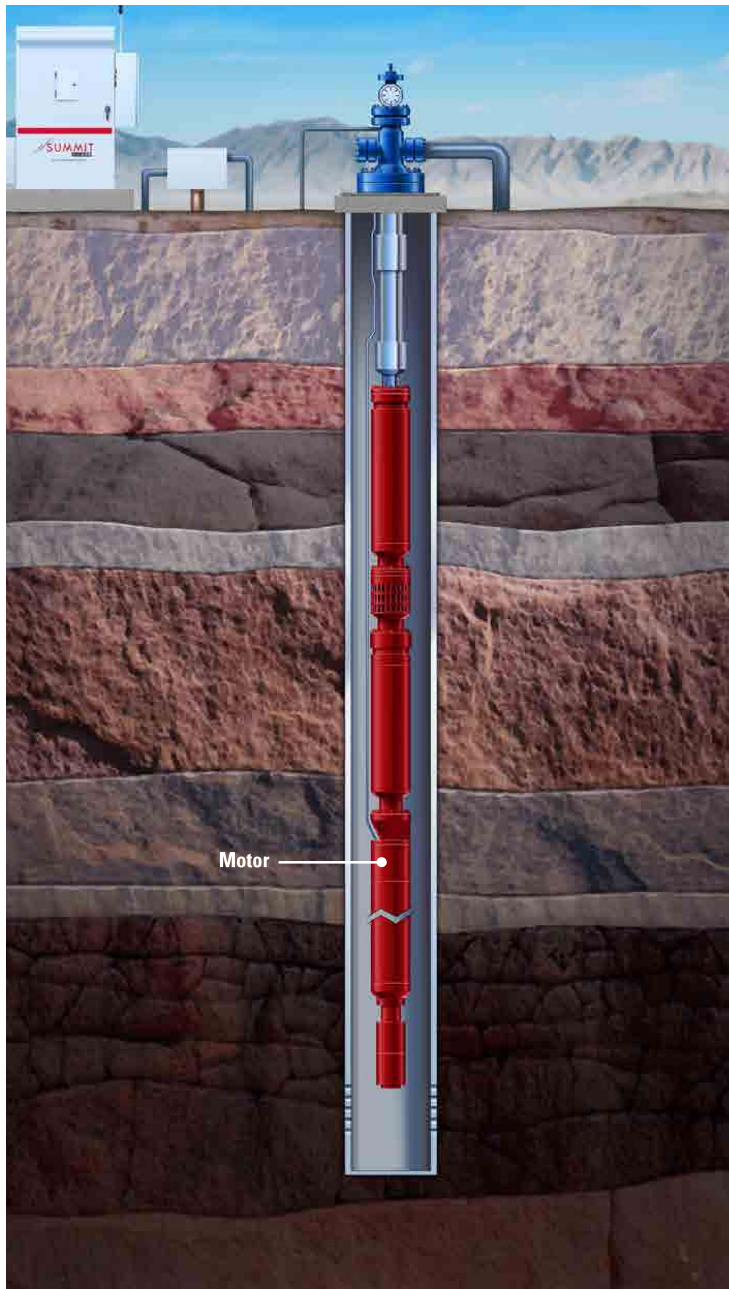


Artificial Lift



Motors

Corsair™ Motors:
Surpassing industry
standards in construction
and performance.



Electric Submersible Motors

Summit ESP® – A Halliburton Service provides systems that are driven by submersible motors engineered to work in extreme downhole environments. Corsair™ electric submersible motors are three-phase, two-pole, squirrel-cage induction motors that are designed with a narrow diameter to fit inside a variety of oilwell casing sizes. The narrow housing of Corsair motors allows them to use fluid movement in the wellbore for cooling purposes. Typically, the ESP system is set above the perforations, allowing fluid from the wellbore to pass along the outside of the motor, absorbing heat, before it enters the intake and is pumped to surface. In cases where a unit must be set below the perforations, a motor shroud can be employed to ensure flow by the motor. Corsair motors are electrically driven from power supplies on the surface. Power is connected from the motor pothead to a power cable that is secured to the entire length of the production tubing. Electrical power is provided by surface-mounted switchboards, variable-speed drives or soft starters. The motor base can accommodate the use of a data acquisition gauge providing wellbore pressure, ambient temperature, motor oil temperature, vibration, amp leakage and discharge pressure readings through a DC signal via the power cable to surface.

All Corsair downhole electrical motors are hand-wound variable-speed motors with a 60-Hz operating speed of around 3450 RPM. The speed of any Summit ESP motor may be adjusted with a variable-speed drive with recommended operating frequencies ranging from 40 to 70 Hz or 2300 to 4025 RPM. Motors are designed to be operated either independently or coupled together in tandem configurations.



This can be applied in configurations ranging from 4 to 1020 horsepower (hp). Many electric submersible pumping systems are designed to rotate counter clockwise. This necessitates the use of lock plates welded to equipment housings to keep them from backing off during operation. Corsair™ motors are configured to rotate clockwise. This allows systems to operate without lock plates, thereby reducing outer diameters and allowing systems to be run into narrower wellbores. Corsair motors are available in 375, 456 and 562 series, and are designed specifically for operation in a variety of casing diameters with maximum efficiency to reduce operating costs.

Corsair motors are engineered and manufactured to withstand high temperatures and to operate in corrosive environments. The motor windings are fully encapsulated with high-temperature electric-grade varnish. This bonds the magnet wires together and prevents chaffing of the wire insulation. The motor's magnetic wire is made from 99.99 percent pure copper and is insulated with two layers of tough, aromatic polyimide film that has an

excellent balance of electrical, physical and chemical properties over a wide temperature range. Corsair motors employ PEEK insulators, polyimide slot sleeves and a proprietary motor oil blend to allow operation in high-temperature environments. The internal motor pressure is equalized with the outside well fluid by use of a seal. The seal also isolates the motor from well fluid, preventing contaminants from entering the motor. In highly corrosive environments, Corsair motors may be fitted with stainless steel components or protected with a flame-sprayed corrosion coating.

Before entering service, every Corsair motor is put through a strict testing regimen. Voltage and amps are recorded for each phase and compared with factory acceptance criteria, ensuring electrical and insulation integrity. In addition, the time that the motor takes to come to a complete stop after the power is disconnected is recorded. The resulting coast time is also compared to factory standards to make sure all the mechanical components are in order.

Motor Technical Information

| Description | Outer Diameter | | Min. Casing Size | | Horsepower Range | |
|-------------|----------------|--------|------------------|--------|------------------|--------|
| | in. | mm | in. | mm | 60 Hz | 50 Hz |
| 375 Series | 3.75 | 95.25 | 4.50 | 114.30 | 22.5–225 | 19–188 |
| 456 Series | 4.56 | 115.82 | 5.50 | 139.70 | 30–480 | 25–400 |
| 562 Series | 5.62 | 142.75 | 7.00 | 177.80 | 60–1000 | 50–834 |

All standard Corsair™ motors include Monel® shafts, bolts and premium carbide mechanical seals; proprietary positive seal elastomers; and extended-run-life thrust bearings.

Monel® is a registered trademarks of Special Metals Corporation.

Motor Technical Information – 375 Series (Single Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|-----|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| DMS | 22.5 | 510 | 19 | 425 | 32.5 | 8.6 | 2.6 | 242 | 110 |
| DMS | 36 | 541 | 30 | 451 | 49 | 12.1 | 3.7 | 360 | 163 |
| DMS | 54 | 1,235 | 45 | 1,029 | 32.5 | 16.9 | 5.1 | 516 | 234 |
| DMS | 54 | 532 | 45 | 443 | 74.5 | 16.9 | 5.1 | 516 | 234 |
| DMS | 75 | 1,150 | 63 | 958 | 49 | 22.7 | 6.9 | 713 | 323 |
| DMS | 100 | 2,257 | 83 | 1,881 | 32.5 | 28.5 | 8.7 | 909 | 412 |
| DMS | 100 | 1,485 | 83 | 1,238 | 49 | 28.5 | 8.7 | 909 | 412 |
| DMS | 100 | 1,218 | 83 | 1,015 | 60 | 28.5 | 8.7 | 909 | 412 |

Standard Features: Carbon steel head, base, and housing
Pothed: Tape-in
Temperature Rating: 180°C (356°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 375 Series (Two-Piece Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|------|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| DMS | 150 | 2,300 | 125 | 1,917 | 49 | 44.7 | 13.6 | 1,426 | 647 |
| DMS | 200 | 2,970 | 167 | 2,475 | 49 | 56.4 | 17.2 | 1,818 | 825 |
| DMS | 200 | 2,436 | 167 | 2,030 | 60 | 56.4 | 17.2 | 1,818 | 825 |

Standard Features: Carbon steel head, base, and housing
Pothead: Tape-in
Temperature Rating: 180°C (356°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 375 Series (Three-Piece Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|------|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| DMS | 225 | 1,950 | 188 | 1,625 | 49 | 67.8 | 20.7 | 2,139 | 970 |

Standard Features: Carbon steel head, base, and housing
Pothead: Tape-in
Temperature Rating: 180°C (356°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 456 Series (Single Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|-----|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| FMS2 | 30 | 530 | 25 | 442 | 41 | 6.0 | 1.8 | 295 | 134 |
| FMS2 | 45 | 570 | 38 | 475 | 56 | 7.5 | 2.3 | 369 | 167 |
| FMS2 | 60 | 525 | 50 | 438 | 80 | 8.9 | 2.7 | 438 | 199 |
| FMS2 | 60 | 985 | 50 | 821 | 43 | 8.9 | 2.7 | 438 | 199 |
| FMS2 | 75 | 555 | 63 | 463 | 95 | 10.4 | 3.2 | 512 | 232 |
| FMS2 | 75 | 1,235 | 63 | 1,029 | 43 | 10.4 | 3.2 | 512 | 232 |
| FMS2 | 90 | 1,480 | 75 | 1,233 | 43 | 11.8 | 3.6 | 581 | 263 |
| FMS2 | 105 | 1,725 | 88 | 1,438 | 43 | 13.2 | 4.0 | 649 | 295 |
| FMS2 | 105 | 1,330 | 88 | 1,108 | 56 | 13.2 | 4.0 | 649 | 295 |
| FMS2 | 120 | 1,970 | 100 | 1,642 | 43 | 14.7 | 4.5 | 723 | 328 |
| FMS2 | 150 | 2,460 | 125 | 2,050 | 43 | 17.6 | 5.4 | 866 | 393 |
| FMS2 | 180 | 2,952 | 150 | 2,460 | 43 | 20.5 | 6.2 | 1,009 | 457 |
| FMS2 | 240 | 3,040 | 200 | 2,533 | 56 | 26.2 | 8.0 | 1,289 | 585 |
| FMS2 | 300 | 3,400 | 250 | 2,833 | 62 | 32.0 | 9.8 | 1,574 | 714 |

Motor Technical Information – 456 Series (Two-Piece Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|------|--------|-------|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| FMS2 | 360 | 3,140 | 300 | 2,617 | 80 | 41.0 | 12.5 | 2,017 | 915 |
| FMS2 | 480 | 3,540 | 400 | 2,950 | 94 | 52.4 | 16.0 | 2,578 | 1,169 |

Standard Features: Carbon steel head, base, and housing
Pothead: Tape-in
Temperature Rating: 180°C (356°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 456 Series (Single Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|---------|-------|-------|-------|-------|------|--------|-----|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| FMS2-HT | 84 | 1,827 | 70 | 1,533 | 33 | 14.7 | 4.5 | 723 | 328 |
| FMS2-HT | 105 | 2,296 | 88 | 1,913 | 32 | 11.1 | 3.4 | 663 | 301 |
| FMS2-HT | 126 | 2,755 | 105 | 1,533 | 32 | 20.5 | 6.2 | 1,009 | 457 |
| FMS2-HT | 168 | 2,837 | 140 | 2,364 | 42 | 26.2 | 8.0 | 1,289 | 585 |
| FMS2-HT | 210 | 3,173 | 175 | 1,533 | 46 | 32.0 | 9.8 | 1,574 | 714 |

Standard Features: Carbon steel head, base, and housing
Pothed: Tape-in
Temperature Rating: 204°C (400°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 562 Series (Single Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|------|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| KMS2 | 60 | 490 | 50 | 408 | 76 | 5.9 | 1.8 | 313 | 142 |
| KMS2 | 60 | 879 | 50 | 733 | 42 | 5.9 | 1.8 | 313 | 142 |
| KMS2 | 90 | 1,325 | 75 | 1,104 | 42 | 7.6 | 2.3 | 403 | 183 |
| KMS2 | 90 | 2,350 | 75 | 1,958 | 24 | 7.6 | 2.3 | 403 | 183 |
| KMS2 | 120 | 1,780 | 100 | 1,483 | 42 | 9.4 | 2.9 | 533 | 242 |
| KMS2 | 120 | 3,130 | 100 | 2,608 | 24 | 9.4 | 2.9 | 533 | 242 |
| KMS2 | 150 | 2,195 | 125 | 1,829 | 42 | 11.1 | 3.4 | 663 | 301 |
| KMS2 | 180 | 2,290 | 150 | 1,908 | 48 | 12.9 | 3.9 | 781 | 354 |
| KMS2 | 240 | 2,810 | 200 | 2,342 | 53 | 16.4 | 5.0 | 992 | 450 |
| KMS2 | 300 | 3,255 | 250 | 2,713 | 57 | 19.9 | 6.1 | 1,198 | 543 |
| KMS2 | 360 | 3,175 | 300 | 2,646 | 70 | 23.4 | 7.1 | 1,500 | 680 |
| KMS2 | 500 | 2,318 | 417 | 1,932 | 133 | 34.0 | 10.4 | 2,178 | 988 |
| KMS2 | 500 | 3,265 | 417 | 2,721 | 94 | 34.0 | 10.4 | 2,178 | 988 |

Standard Features: Carbon steel head, base, and housing
Pothead: Tape-in
Temperature Rating: 180°C (356°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 562 Series (Two-Piece Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|--------|-------|-------|-------|-------|------|--------|------|--------|-------|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| KMS2 | 720 | 3,430 | 600 | 2,858 | 129 | 47.4 | 14.4 | 3,036 | 1,378 |
| KMS2 | 1000 | 3,600 | 834 | 3,000 | 171 | 68.2 | 20.8 | 4,368 | 1,982 |
| KMS2 | 1,000 | 4,636 | 834 | 3,864 | 133 | 68.2 | 20.8 | 4,368 | 1,982 |

Standard Features: Carbon steel head, base, and housing
Pothed: Tape-in
Temperature Rating: 180°C (356°F)
Optional Features: Stainless steel head, base, and housing

Motor Technical Information – 562 Series (Single Construction)

| Series | 60 Hz | | 50 Hz | | Amps | Length | | Weight | |
|---------|-------|-------|-------|-------|------|--------|------|--------|-----|
| | HP | Volts | HP | Volts | | ft | m | lb | kg |
| KMS2-HT | 120 | 2,092 | 100 | 1,743 | 31 | 11.1 | 3.4 | 663 | 301 |
| KMS2-HT | 144 | 2,183 | 120 | 1,819 | 36 | 12.9 | 3.9 | 781 | 354 |
| KMS2-HT | 192 | 2,679 | 160 | 2,233 | 44 | 16.4 | 5.0 | 992 | 450 |
| KMS2-HT | 240 | 3,103 | 200 | 2,586 | 42 | 19.9 | 6.1 | 1,198 | 543 |
| KMS2-HT | 288 | 1,635 | 240 | 1,363 | 95 | 23.4 | 7.1 | 1,500 | 680 |
| KMS2-HT | 400 | 2,210 | 333 | 1,842 | 99 | 34.0 | 10.4 | 2,178 | 988 |
| KMS2-HT | 400 | 3,151 | 333 | 2,626 | 69 | 34.0 | 10.4 | 2,178 | 988 |

Standard Features: Carbon steel head, base, and housing
Pothed: Tape-in
Temperature Rating: 204°C (400°F)
Optional Features: Stainless steel head, base, and housing