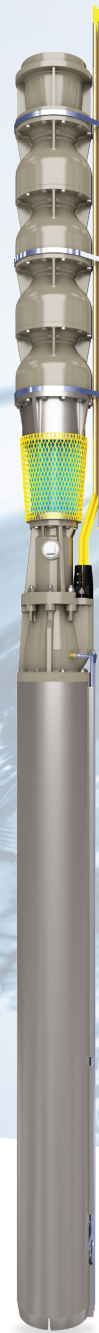




Byron Jackson® SUBM Submersible Pumps and OIL Oil-Filled Motors

Versatile, rugged designs maximize service life and value



Experience In Motion

Extend service life in extreme deep-well applications

Built for the world's most demanding services, long-lasting Byron Jackson SUBM electric submersible pumps and OIL oil-filled motors from Flowserve offer versatility and low total cost of ownership.

Pump units are engineered to deliver efficiency as high as 89%, depending on the motor size.

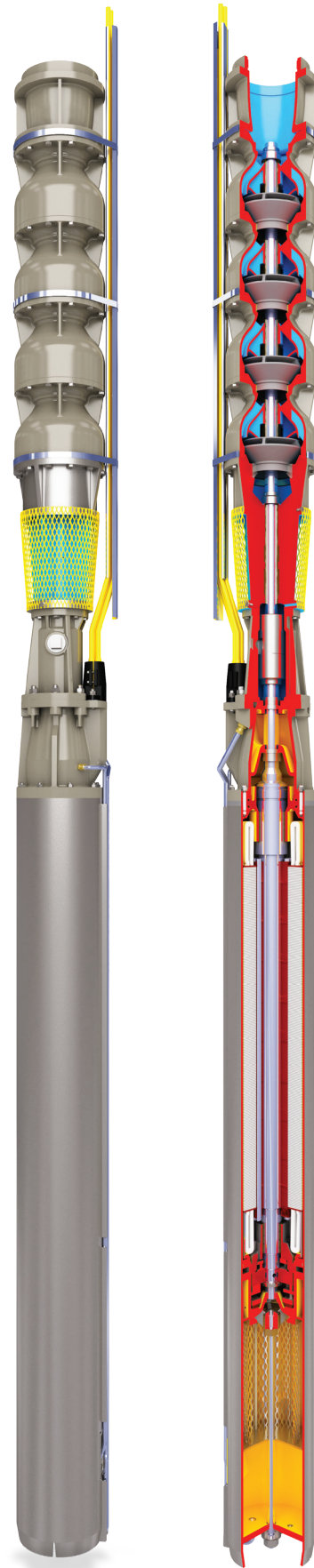
The rugged design and construction enable plant operators to avoid the costs of pushing and pulling pumps by extending time between repairs. The motor design has fewer components that can fail. And the wall thickness of the stator shell tolerates corrosion in some applications for as long as 50 years without compromise.

Precise configuration for specific applications can be realized with numerous hydraulic, cooling, lubrication, sealing, materials and accessory options, including cable, corrosion prevention and voltage requirements.

In addition, Flowserve extensively tests and inspects Byron Jackson SUBM pumps and OIL oil-filled motors to ensure operational safety under the most adverse conditions.

Engineered for maximum value

- **Quick delivery and engineered flexibility** — SUBM pumps come in standardized designs for quick turnarounds or can be configured to custom specifications.
- **Unsurpassed hydraulic coverage** — Through design innovations and multiple Flowserve legacy brands, their extensive hydraulic coverage meets nearly any duty condition requirement.
- **Wide range of material options** — Customers can select from numerous materials — including iron, bronze, stainless steel and super duplex — to maximize pump life in a range of applications.
- **Maximum flow** — Pump hydraulics are designed to maximize flow rate per well size.
- **High efficiency** — Pump and motor units provide maximum efficiency, resulting in lower operating costs. All motors are inverter-duty rated as standard and can be used with variable frequency drives (VFDs) which are optimized for speed operating conditions. The inverter design protects against motor stress that otherwise can occur with VFDs.
- **High-quality, cost-effective motors** — Rewindable oil-filled motors maximize value by providing long life and lower total lifecycle costs.



NSF/ANSI 61 and 372 certified

Byron Jackson SUBM electric submersible pumps and OIL oil-filled motors are manufactured in accordance with NSF/ANSI 61 and 372 requirements.

This enables plant operators to avoid potential adverse human health effects from products added directly to water for its treatment and indirectly to water via contact with treatment, storage, transmission and distribution system components.

Proven partner for deep-well pumping systems

Flowserve offers the world's most complete line of submersible pumps with oil-filled motors and equipment for the entire deep-well pumping system, including motors, cable and column pipe. Motor options include VFD and high-temperature models.

Customizable

Byron Jackson SUBM submersible pumps and OIL oil-filled motors can be customized to meet special applications and requirements for:

- Cables
- Corrosion prevention
- Hydraulics
- Voltages

Global service network

In addition, we support customers through our global network of Quick Response Centers (QRCs).

Application versatility

Flowserve SUBM submersible pumps and OIL motors are ruggedly designed to provide long service life in a variety of applications and operating conditions.

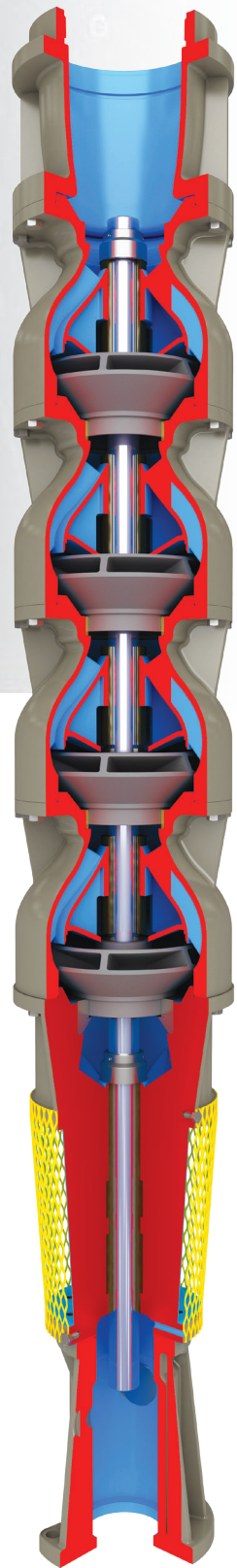
Industries and applications

- Mining
 - Dewatering
- Oil and gas
 - Midstream
 - Offshore platforms
 - Pipelines
 - Storage caverns
 - Water injection
- Water
 - Fountains (pressure boosting)
 - Geothermal
 - Injection
 - Potable water supply
 - Seawater (ballast, fire protection)

Operating parameters

- Flows to 6,000 m³/h (26,415 gpm)
- Heads to 800 m (2,625 ft)
- Motor sizes to 1,500 kW (2,000 hp)
- Speeds from 1,000 to 3,600 rpm
- Two-, four- and six-pole designs (others are also available)
- Voltages from 200 to 6,600 V
- Frequencies: 50 and 60 Hz





Byron Jackson SUBM submersible pumps

Byron Jackson SUBM submersible pumps from Flowserve offer an extraordinary range of performance as a result of proprietary hydraulics along with optimized bowls and impellers that ensure efficient operation.

Multiple design configurations and a broad hydraulic coverage ensure you get a cost-effective solution that precisely meets application requirements. Heavy-duty construction extends both maintenance intervals and pump life to help you control lifecycle costs.

Certifications and compliance

- NSF/ANSI 61 and 372 drinking water certifications
- AWWA E102 design standard

Modular design for maximum flexibility and value

Byron Jackson SUBM electric submersible pumps are designed by Flowserve on the principle of a modular structure. Thus, with a limited number of parts, different tailor-made requests can be achieved. As a result, Flowserve submersible pump units can provide economic solutions for every user's requirements.

- **Heavy-duty impellers and bowls** deliver maximum efficiency over a broad operating range. Impellers are dynamically balanced to minimize vibration and extend service life.
- **Enclosed impellers** are engineered for close running clearances with the bowls to maintain efficiency over a broad operating range. A full offering of semi-open impellers is available for specific applications.
- **Bowl bearings** with a high length-to-diameter ratio on either side of the impeller provide rigid support for the bowl shaft.
- **Suction inlet** flow path is maximized and optimally designed for efficiency.
- **Reliable adaption system** between pump and motor provides maximum shaft support to reduce vibration and extend seal life.
- **Heavy-duty sleeve bearings** on each side of each impeller provide minimum bearing span and maximum shaft support. The long top case bearing provides additional pump rotor stability.
- **Materials of construction** include bronze, carbon steel, cast iron, Ni-Al-Br, stainless steel, and duplex and super duplex stainless steel.



Byron Jackson OIL oil-filled submersible motors

Byron Jackson OIL submersible motors from Flowserve are built for the most demanding deep-well services. They incorporate an internal, self-contained force feed, filtered, cooled oil circulation system. It maintains continuous lubrication and provides excellent electrical insulation and corrosion resistance.

Known for their long-lasting performance — extending to 30 or more years — these rugged and reliable units offer outstanding sustainability along with significant total lifecycle cost savings. They comply with NSF/ANSI 61 and 372 requirements.

Built to perform

Three-phase squirrel cage induction motor provides reliable operation and extends product life.

Class H windings: The specially designed windings for low and high voltage are insulation Class H (180°C/356°F). They provide a larger safety margin compared to the previous class F standard windings and typical water-filled motors with standard Class Y (90°C/194°F) windings.

Double-acting thrust bearing system offers continuous up or down thrust capability.

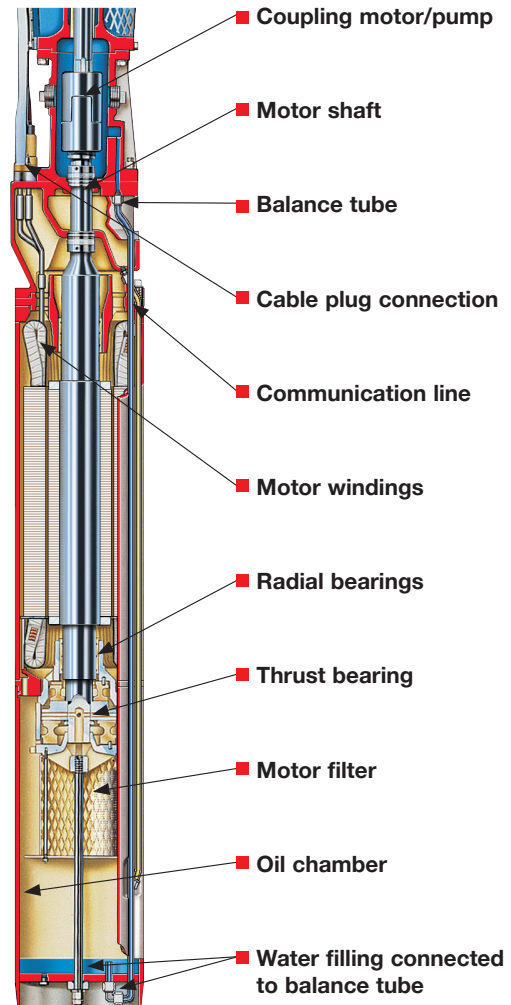
Dual bearings between pump and motor have minimum bearing span and maximum shaft support.

Special metallurgy is available for corrosive services.

Sealed power cable plug-in feature ensures reliable operation and ease of installation by eliminating the need for field splicing.

Food-grade oil: Motors are filled with a pure non-hygroscopic U.S. Food & Drug Administration (FDA)-approved highly refined mineral oil of superior dielectric strength. This oil is effectively contained by mechanical seal arrangements.

Corrosion resistance: The oil-filled design provides excellent insulation with exceptional lubrication fluid corrosion resistance. These benefits are unaffected by time.



Power output*

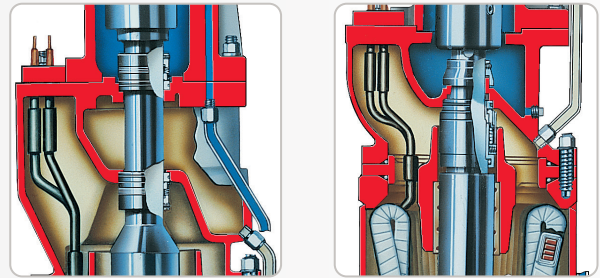
Power Output Range: Four-Pole Submersible Oil-Filled Motors						
Motor Type		10M	12M	14M	17M	21M
50 Hz Power Output (S.F. 1.0)	kW	25 to 63	80 to 132	80 to 200	160 to 400	400 to 1,350
	hp	34 to 85	107 to 180	107 to 270	215 to 540	540 to 1,350
60 Hz Power Output (S.F. 1.1)	kW	30 to 75	93 to 150	93 to 225	185 to 450	450 to 1,500
	hp	40 to 100	125 to 200	125 to 300	250 to 600	600 to 2,000

*Two-pole, oil-filled submersible motors on request

Mechanical seal options

Byron Jackson OIL submersible oil-filled motors are available with single or double mechanical seals to suit application requirements:

- The **single, pressurized mechanical seal** is designed for hydrocarbon services and non-vertical applications.
- The **double mechanical seal** incorporates two separate highly engineered bellows seals, providing dual protection for the motor.



Motor cable plug connection

The exclusive power cable sealed plug-in-design, with a replaceable gasket, assures a waterproof connection at the motor terminals. In addition, it eliminates the need for an untested splice in the field.

The complete power cable assembly can be boxed and shipped as a separate component, reducing the potential for damage during shipping and installation.

Thrust bearings

Both up and down pump thrust loads can be continuously carried by the precision-machined solid or pivot shoe-type thrust bearing. There is no metal-to-metal contact, as the mirror-lapped bearing surfaces are supported on a film of filtered oil.

Byron Jackson submersible motor efficiency includes the thrust bearing losses; no further efficiency reduction is required for this thrust bearing design. The lower thrust bearing face incorporates exclusive lubrication pockets to reduce start-up friction.



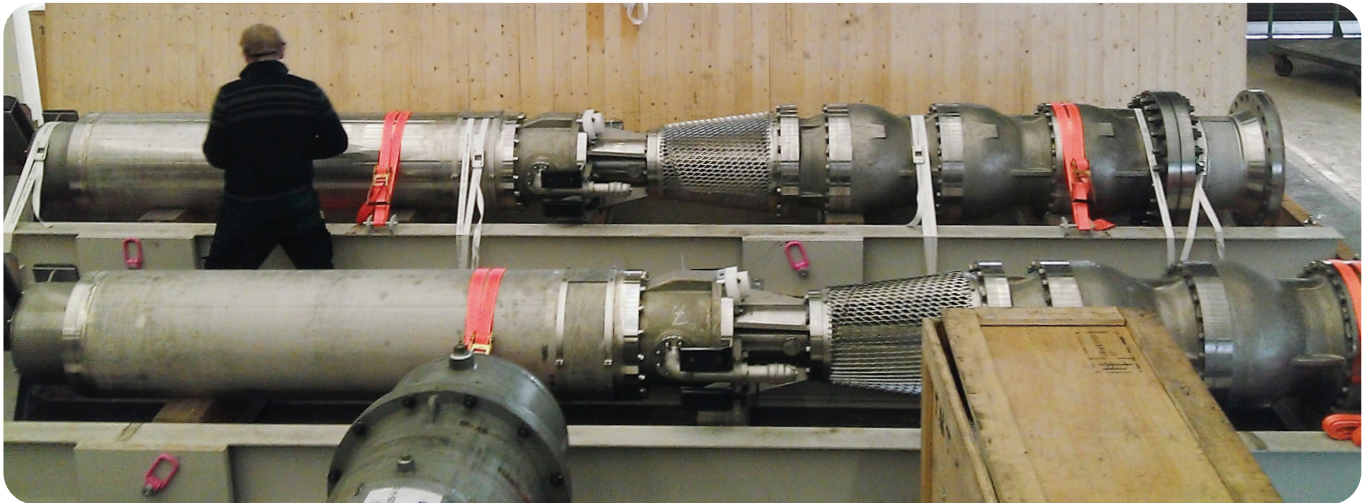


Economic motor exchange program

In typical applications, a submersible pump will wear out before the motor. Should a motor issue arise, Flowserve offers an exchange program to help plant operators minimize unplanned downtime and repair costs.

A faulty motor can be exchanged for a rebuilt model of the same size that Flowserve has refurbished to original specifications with qualified, as-new parts.

Plant operators get a trade-in credit, i.e., the exchanged motor costs less than a new motor but it includes a new motor warranty.



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