

What are the Key Components of an Electric Motor? | TECO

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Glossary

What are the Key Components of an Electric Motor?

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Electric motors are critical to industrial operations across sectors such as mining, water & wastewater, oil & gas, and manufacturing. Designed for high reliability and energy efficiency, modern motors are precision-engineered systems built to perform under demanding conditions.

At TECO , we design and supply electric motors engineered for performance in severe-duty applications. Our motors can feature IP66 ingress protection, Class F and H insulation, and can be available with IECEx and ATEX-certified enclosures (Ex d, Ex e, Ex nA, Ex tD) for hazardous locations. Paired with TECO variable speed drives (VSDs) and soft starters, these solutions help reduce energy consumption and increase uptime in mission-critical systems.

Explore the ranges below or speak with our local team.

How an Electric Motor Works:

Electric motors convert electrical energy into mechanical energy through electromagnetic interaction. In alternating current (AC) induction motors —the most common type in industrial use—this is achieved by generating a rotating magnetic field in the stator that induces current in the rotor, creating torque and rotation.

Key operating principles include:

Electromagnetic Induction: Fundamental to rotor current generation.

Rotating Magnetic Field: Produced by three-phase stator windings to ensure smooth and continuous torque.

Torque Production: Arises from the interaction between the stator's magnetic field and rotor-induced current.

Understanding these fundamentals is essential for selecting the right motor based on load characteristics, speed control requirements, and duty cycles.

A Breakdown of the Components:

Industrial motors are engineered with precision to meet mechanical, thermal, and electrical performance requirements. The main components are categorized as stationary and rotating elements.

Stationary Components

Stator Core & Windings: The laminated iron core reduces eddy current losses. The windings are copper conductors. In the case of the TECO MAXeV4 , these are insulated to Class H (180°C), ensuring thermal endurance under continuous duty (S1).

Enclosure / Frame: TECO motors feature cast iron or aluminum housings with cooling fins and IP protection ratings up to IP66 for dust-tight sealing and resistance to high-pressure water jets. Options include TEFC (Totally Enclosed Fan Cooled) or flameproof enclosures for hazardous areas .

Terminal Block: Certified to IECEx/ATEX when required, this connects external power cables and facilitates phase identification and earthing.

Cooling Fan & Fan Cover: Ensures effective air circulation over the motor frame for heat dissipation. The fan type is selected based on motor duty and noise level requirements.

Rotating Components

Rotating Components

Rotor: Either squirrel-cage or wound type. Squirrel-cage rotors use aluminum or copper bars with shorting rings and are dynamically balanced to ISO 1940 standards.

Shaft: A precision-machined carbon steel or stainless steel shaft transfers torque to driven equipment. Tolerances comply with ISO fits (e.g., k6, h7).

Bearings: Deep groove ball bearings or roller bearings with optional grease fittings or sealed-for-life designs. Bearings are selected based on radial/axial load, speed, and expected service life.

End Shields / Bearing Housings: Support the shaft and ensure proper alignment and heat dissipation.

Engineering Considerations for High-Performance Motors

When selecting an industrial electric motor , several engineering parameters must be evaluated:

Duty Type (IEC 60034-1): TECO motors are rated S1 (continuous duty) and also available for intermittent and variable load applications.

Thermal Class: Class H insulation allows higher temperature rise limits for long life in hot environments.

Ingress Protection (IP): TECO motors rated up to IP66 offer full protection against dust and powerful water jets, ideal for mining and outdoor installations.

Explosion Protection: Motors for hazardous zones comply with IECEx/ATEX standards (e.g., Ex d flameproof, Ex e increased safety).

Energy Efficiency: High-efficiency IE3 and IE4 motors reduce operating costs and support sustainability goals.

VSD Compatibility: TECO motors are inverter-ready, with insulation systems designed for VFD-induced voltage stress and bearing protection options.

At TECO, we're committed to delivering high-standard products, like our electric motor, with our intelligence and expertise to ensure that our products perform optimally. Identify the difference with TECO as your solution provider.

Our Range

At TECO, we have a wide range of electric motors for you to choose from, according to your needs. For instance:

Low Voltage Motors

Single-Phase Electric Motors

Medium and High Voltage Motors

Our website makes it easy for you to navigate our options so you can make a decision that works best with your application. However, our team is always available to help.

The TECO Difference

For over 50 years, TECO has been a trusted partner in industrial motion solutions. With vertically integrated manufacturing, local engineering support, and decades of experience across key industries, we deliver motors and drives built for performance and reliability.

Extensive Local Stock: TECO maintains substantial inventory across 6 strategic warehouse locations in Australia and New Zealand, ensuring rapid availability and reduced lead times for standard motors.

TECO ModShop Capabilities: Our in-house modification workshop allows for fast, certified adaptations — including special shafts, heaters, RTDs, terminal box repositioning, paint systems, and more — without compromising compliance or warranty.

Application Expertise: From mining conveyors to hazardous-area pumps, our technical team supports motor selection, integration with VSDs, and compliance with IEC/AS standards.

When uptime, compliance, and delivery matter, TECO delivers.

If you have questions about which motor is right for your application, contact us today, and we'll help you make your decision. Our specialists are available and ready to answer any questions.

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Electric motors convert electrical energy into mechanical motion, but the way they use electrical energy differs significantly. The two broad categories, Alternating Current (AC) and Direct Current (DC), use different

[Read more](#) [IP66 Rating: What does an IP66 rating mean, specifically for electric motors?](#)

When specifying an electric motor, one of the lines on the specification is routinely IP rating. It is very common for industrial specifications in particular to specify IP66, but

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