

## Reluctance & Hysteresis Motors-Construction, Working Principle, Application.

Reluctance and hysteresis motors are two types of electric motors that are used in various applications. While both motors rely on different principles of operation, they share similarities in their construction and are commonly used in situations where high torque and precise control are required. In this article, we will explore the construction, working principle, and applications of reluctance and hysteresis motors.

### Construction of Reluctance Motors:

Reluctance motors consist of a stator and a rotor. The stator is made up of laminated iron cores with evenly spaced teeth, which are wound with coils to create magnetic poles. The rotor, on the other hand, is also made up of laminated iron cores but with fewer teeth compared to the stator. The rotor is not wound with coils and has no electrical connections.

### Construction of Hysteresis Motors:

Hysteresis motors consist of a single-layered rotor made of a magnetically hysteresis material, usually a magnetic alloy such as cobalt steel or chromium steel. The stator of a hysteresis motor is similar to that of a reluctance motor, comprising laminated iron cores with coils wound around them.

### Working Principle of Reluctance Motors:

Reluctance motors operate based on the principle of the rotor being attracted to the region of minimum reluctance in the magnetic circuit. When the stator windings are energized, they create a magnetic field that induces magnetic poles in the rotor. The rotor aligns itself with the magnetic field, causing a torque to be produced. As the rotor moves, the magnetic field changes, and the rotor aligns itself with the new magnetic field configuration, resulting in continuous rotation.

### Working Principle of Hysteresis Motors:

Hysteresis motors operate based on the phenomenon of hysteresis, which refers to the lag between the magnetic field and the magnetic material's response. The rotor of a hysteresis motor is made of a magnetic material with high hysteresis, allowing it to retain a significant amount of magnetism even after the magnetic field changes direction. As the stator windings create a rotating magnetic field, the rotor follows the field due to its hysteresis properties, resulting in rotation.

### Applications of Reluctance Motors:

Reluctance motors are commonly used in applications that require high torque at low speeds, such as conveyors, printing presses, and machine tools. They are also utilized in fans, blowers, and pumps, where precise control of speed and torque is essential.

#### Applications of Hysteresis Motors:

Hysteresis motors find applications in instruments where accurate and precise motion control is necessary, such as record players, robotics, and medical devices. They are also used in devices that require constant speed and low noise, such as clocks and timers.

In conclusion, reluctance and hysteresis motors are two distinct types of electric motors with different working principles and construction. Reluctance motors rely on the attraction of the rotor to the region of minimum reluctance, while hysteresis motors utilize the hysteresis phenomenon of magnetic materials. Both motors have their specific applications, ranging from industrial machinery to precision instruments. Understanding their construction and working principles can aid in selecting the most suitable motor for a given application.