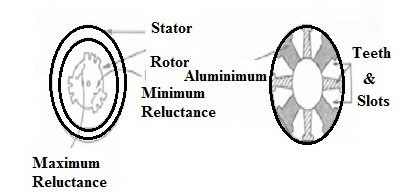
**RELUCTANCE MOTOR**

his is one kind of advanced motor which includes both [the stator](https://www.elprocus.com/what-is-a-stator-construction-working-and-its-uses/) and the rotor similar to a normal electric motor. These motors work with a precise rotating magnetic field (RPM) by synchronizing the speed of the rotor using the RMF of the stator. The power density delivered by these motors is high at low cost to make them attractive in several applications. The **working principle of reluctance motor** is, whenever a magnetic material is located within the magnetic field, then it always brings into line in the less reluctance way.

Construction:

The construction of this motor is shown below. The designing of this can be done by removing the teeth in four locations to form a four-pole structure.

The rings at two ends are short-circuited. Once the stator of the motor is aligned to a single-phase supply, the motor works like a[single-phase induction motor](https://www.elprocus.com/single-phase-induction-motor/). Once the motor’s speed reaches the highest level of synchronous speed, then a centrifugal switch will detach the auxiliary winding. The motor increases the speed like a single-phase motor through the major winding in process.



The torque of this motor can be generated because of the rotor tendency to connect itself in the least reluctance position, once the motor speed is nearer to the synchronous speed. Therefore, the rotor drags in synchronism. The inertia of load must be in the limits for suitable effectiveness. At synchronization, the torque of induction will disappear, except the rotor remains in synchronization because of the torque in synchronous reluctance.

**Working of Reluctance Motor**

The essential parts of this motor are the stator and the rotor. These two are stationary parts that are separated through an air gap. Based on the motor type, the motor construction will be changed but the basic working principle will be the same. The stationary part like stator includes salient pole-pairs which can be formed through flowing current using a wire. The rotor can be formed with ferromagnetic metal and it includes its own poles.

These poles follow the outlines of the magnetic field of the stator. Once the salient pole of the rotor connects to the salient pole of the stator, then the rotor is in the least reluctance position. So the magnetic resistance amount is less at this end. When a stator pole connects to the slots or notches of the rotor, then the rotor will be in the highest reluctance position. Because of energy protection, the rotor will constantly move toward the least reluctance position. So when the rotor is not aligned fully, then a reluctance torque can be generated. This torque will drag the rotor toward the adjacent salient stator pole to cause rotation.

### Types of Reluctance Motor

Reluctance motors are classified into different types like synchronous and switched.

**Synchronous Reluctance Motor**

These motors run precisely at synchronous speed and this can be achieved with the help of a three-phase stator winding as well as a rotor to implement salient rotor poles & inner magnetic flux walls. The rotor frequently executes a modified squirrel cage in the region of salient poles, so that it helps from the effect of induction to turn into self-starting. Once the motor activates, it is moved near to synchronous speeds through induction, after that it locks into synchronization through the reluctance torque which is generated from the barriers of rotor flux.

**Switched Reluctance Motor**

Switched reluctance motor is one kind of [stepper motor](https://www.elprocus.com/stepper-motor-types-advantages-applications/) including some poles. The construction of this motor cost is less as compared with an electric motor due to its simple structure. These motors are mainly used where the rotor is kept inactive for long periods in explosive environments like mining because it works without a mechanical commutator. These motor phase windings are isolated electrically with each other and result in higher fault tolerance as compared with AC induction motor driven by an inverter.

**Advantages**

The **advantages of reluctance motor** include the following.

* It doesn’t require DC supply.
* Stable characteristics
* Maintenance is less
* Less heat
* No magnets
* [Speed control](https://www.elprocus.com/speed-control-of-dc-motor-by-android-application/)

**Disadvantages**

The **disadvantages of reluctance motor** include the following.

* Efficiency is less
* [Power factor](https://www.elprocus.com/power-factor-calculation/) is poor
* Frequency control
* The capacity of these motors is less to drive the loads
* Less inertia rotor is required.

**Applications**

The **applications of the reluctance motor** include the following.

* Signaling Devices
* [Control Devices](https://www.elprocus.com/devices-control-mechanism-used-in-power-electronics/)
* Automatic regulators
* Recording Devices
* Clocks
* Tele printers
* Gramophones
* Analog electric meters
* Electric vehicles
* Power tools like drill lathes, band saws & presses