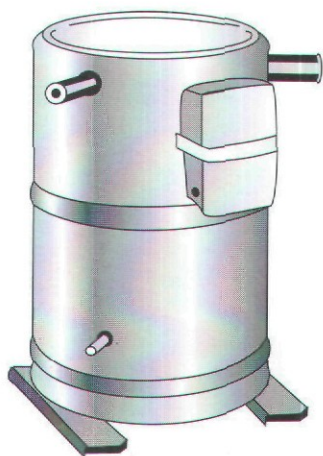




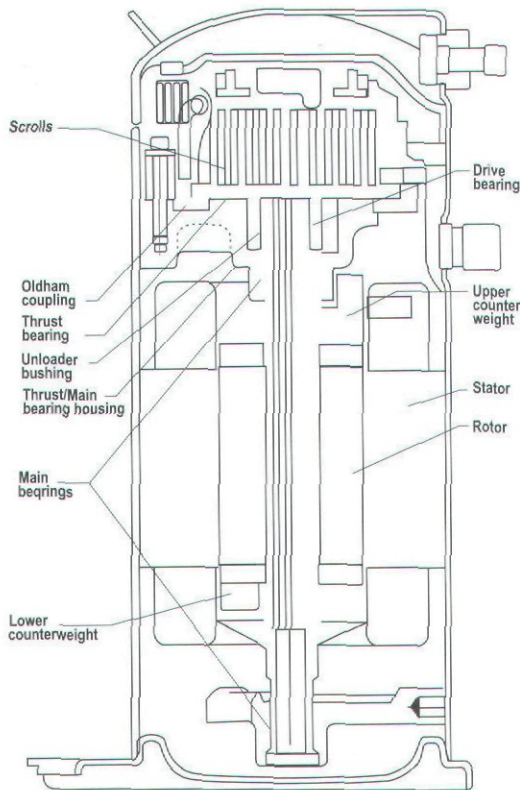
## Compressors used in Window, Split and Packaged Airconditioners

As mentioned earlier the outdoor unit encloses the compressor and the condenser. The compressors used in Window, Split and Packaged Airconditioners are typically **hermetically sealed** compressors. A hermetically sealed compressor is a gas tight steel shell within which is housed an electrical motor and the compressor unit. These compressors may be of the Reciprocating type, the Scroll type or the Rotary type. Let us take a brief look at these compressors and how they work.

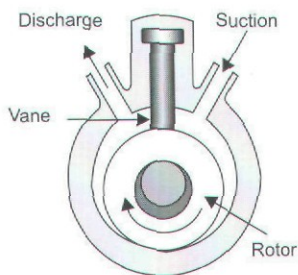


**Fig. 14.** Sealed Reciprocating Compressor

- **Sealed Reciprocating Compressors:** These compressors typically have one or two pistons mounted on the crankshaft extension of the motor. As the motor turns the crankshaft, the piston moves up and down in the cylinder. On the top of the cylinder is mounted a valve plate assembly with a suction and discharge valve. Each time the piston moves down, the suction valve opens and the gas is sucked into the cylinder. When the piston moves up, the gas is pushed against the discharge valve which opens to let the compressed gas out. These compressors are available from very small fractional ton capacities up to 10 ton units.
- **Sealed Scroll Compressors:** Scroll compressors are a recent innovation. They are inherently more efficient and are capable of producing power savings. Consequently they have become very popular in recent years. Scroll compressors use two interlocked spiral-shaped members which enclose the refrigerant gas in pockets between them. One of the spiral-shaped members is fixed and the other rotates causing the refrigerant to be squeezed into ever decreasing



**Fig. 15. Sealed Scroll Compressor**



**Fig. 16. Sealed Rotary Compressor**

pockets until it reaches the centre from where it is discharged. These compressors are currently available in small capacities of up to 14 tons. The advantages include high reliability, low maintenance, low noise and vibration, and high efficiency.

By virtue of a further advancement in technology, even more energy efficient systems using Tandem Scrolls are now available. These **Tandem Scrolls** can produce remarkable power savings under part load conditions. Here two Scroll compressors are connected in parallel to a common condenser. Under part load conditions when one of the two compressors trips, the remaining running compressor uses the full double sized condenser translating to very favourable operating conditions resulting in high energy efficiency. Tandem Scroll systems will therefore be a desirable choice for all applications where the inside load fluctuates.

- **Sealed Rotary Compressors:** The Rotary compressor has a turning rotor eccentric to the cylinder housing, and blades which slide to form a continuous seal for the refrigerant gas. At the beginning of the stroke a volume of refrigerant gas enters the chamber. As the stroke progresses the nature of eccentricity squeezes the gas thereby compressing it.





Rotary compressors are quieter compared to Reciprocating compressors. However, owing to technical constraints, Rotary compressors are far more successful in capacities upto 2 Ton. By virtue of being far quieter, they have become more popular in window airconditioners and to some extent in split airconditioners.