

# Refrigeration and Air Conditioning

There are various types of compressors used in the refrigeration and air conditioning machines, these are: reciprocating, rotary, screw, centrifugal and scroll. All these have been described below briefly:

- **What is Refrigeration Compressor**

The compressors are one of the most important parts of the refrigeration cycle. The compressor compresses the refrigerant, which flows to the condenser, where it gets cooled. It then moves to the expansion valve, and the evaporator and it is finally sucked by the compressor again. For the proper functioning of the refrigeration cycle, the refrigerant must be compressed to the pressure corresponding to the saturation temperature higher than the temperature of the naturally available air or water. It is the crucial function that is performed by the compressor. Compression of the refrigerant to the suitable pressure ensures its proper condensation and circulation throughout the cycle. The capacity of the refrigeration or air conditioning depends entirely on the capacity of the compressor.

- **Types of Refrigeration and Air Conditioning Compressors**

There are various types of compressors used in the refrigeration and air conditioning machines, these are: reciprocating, rotary, screw, centrifugal and scroll. All these have been described below briefly:

- 

- **1) Reciprocating Compressors:**

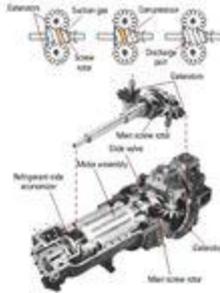
The reciprocating compressors are one of the most widely used types of the refrigerating compressors. They have piston and cylinder arrangement like the automotive engine. The reciprocating motion of the piston due to external power compresses the refrigerant inside the cylinder. There are three types of reciprocating compressors: hermetically sealed, semi-hermetically sealed and open type. The open of reciprocating compressors can be of single cylinder type or multi-cylinder type.



- 

- **2) Screw Compressors:**

The screw compressors comprise of the pair of meshing screws between which the refrigerant gets compressed. They can produce high pressure for small quantity of gas. They consume less power than the reciprocating compressors and are being used widely. It can be used with refrigerants like R12, R22, and others.

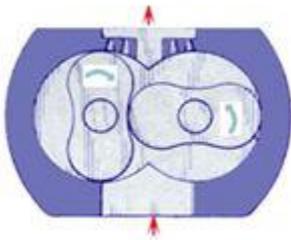


- 

- 

- **3) Rotary Compressors:**

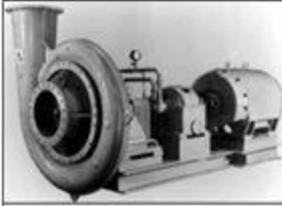
The rotary compressors have two rotating elements, like gears, between which the refrigerant is compressed. These compressors can pump the refrigerant to lower or moderate condensing pressures. Since they can handle small volume of the gas and produce lesser pressure, they are used in fewer applications.



- 

- **4) Centrifugal Compressor:**

The centrifugal compressors comprise of the impeller or the blower that can handle large quantities of gas but at relatively lower condensing pressure. It is suitable for working with refrigerants like R-11, R-113 etc.



A single stage centrifugal compressor (left) driven by an electric motor (right) using gearbox (center). Process gas enters the compressor through the flanged opening at left center and is discharged through the flange in the upper left corner.

## 5) Scroll Compressors:

The scroll compressor comprises of two interleaved scrolls of which one is fixed and the other orbits eccentrically without rotating. During its motion small gaps are created between the scrolls where the refrigerant gets compressed. The scrolls can have different shapes like involute, Archimedean spiral or hybrid curve. In another arrangement both the scrolls may be rotating eccentrically to produce the compression.

