TYPES OF COMPRESSORS

COMPRESSORS

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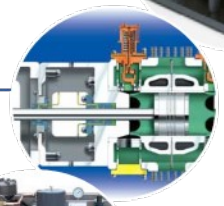
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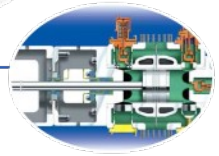
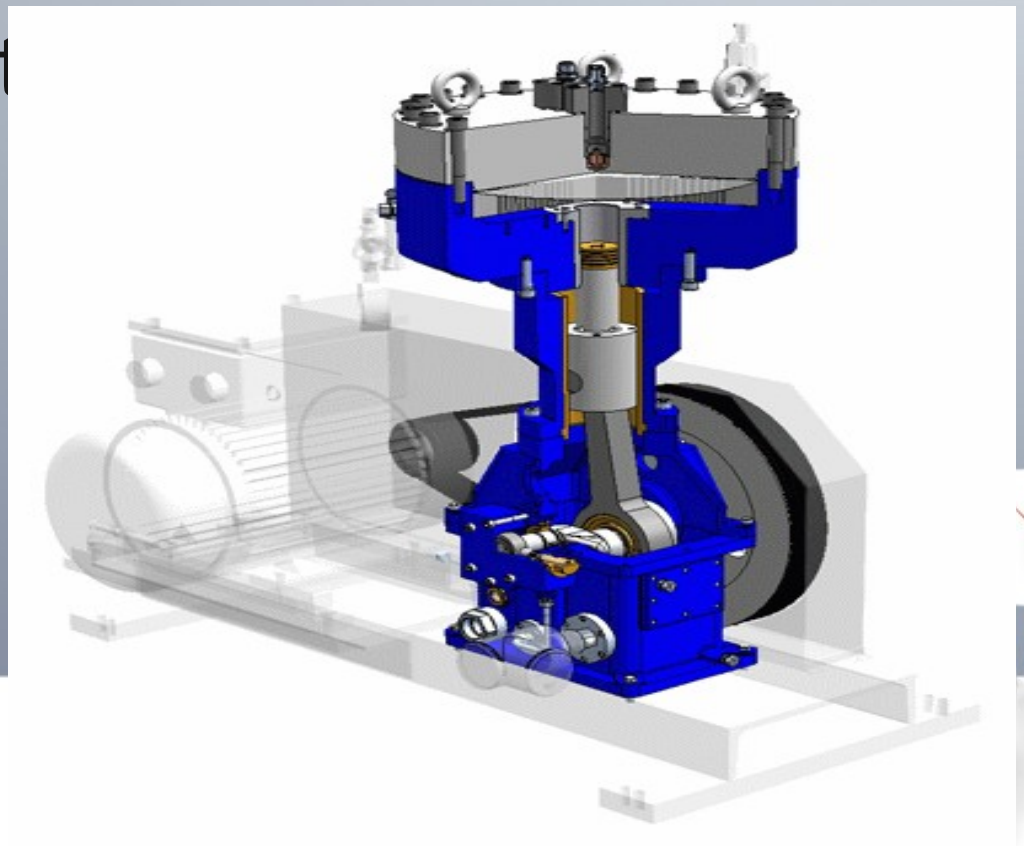

ADVANTAGES

WHAT IS COMPRESSOR?

- Compressors are mechanical devices that compresses gases. It is widely used in industries and has various applicat



How They Are Different From Pumps?

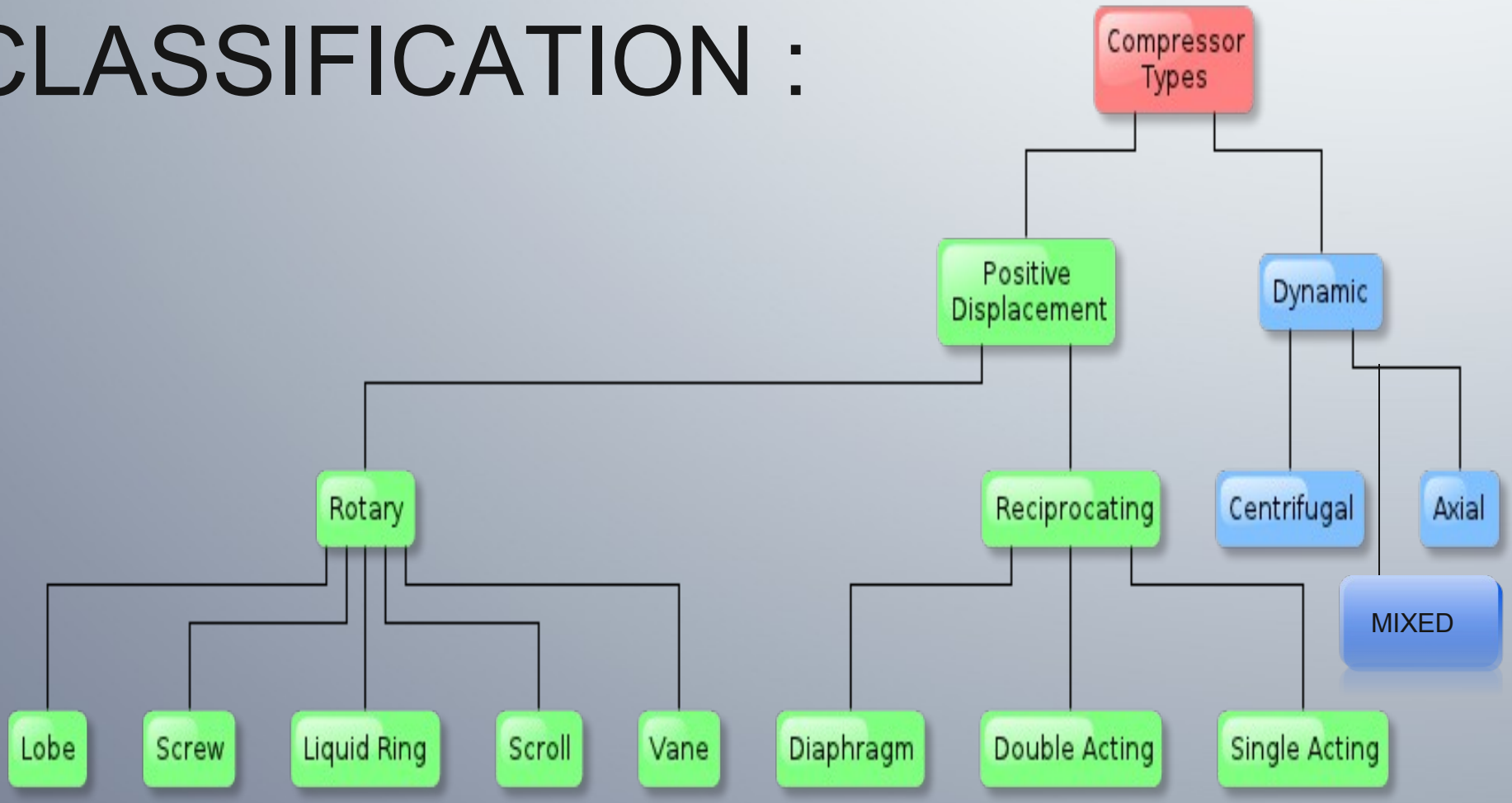
- Major difference is that compressors handles the gases and pumps handles the liquids.
- As gases are compressible, the compressor also reduces the volume of gas.
- Liquids are relatively incompressible.

WHY WE NEED?

Compressors have many everyday uses, such as in :

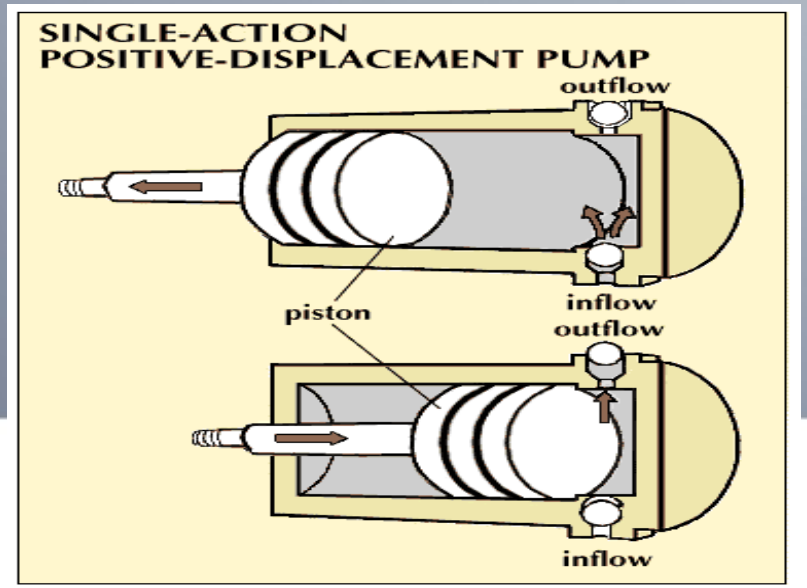
- Air conditioners, (car, home)
- Home and industrial refrigeration
- Hydraulic compressors for industrial machines
- Air compressors for industrial manufacturing

CLASSIFICATION :



Positive Displacement

- Positive-displacement compressors operate by forcing a fixed volume of fluid from the inlet pressure section of the compressor into the discharge zone of the compressor.

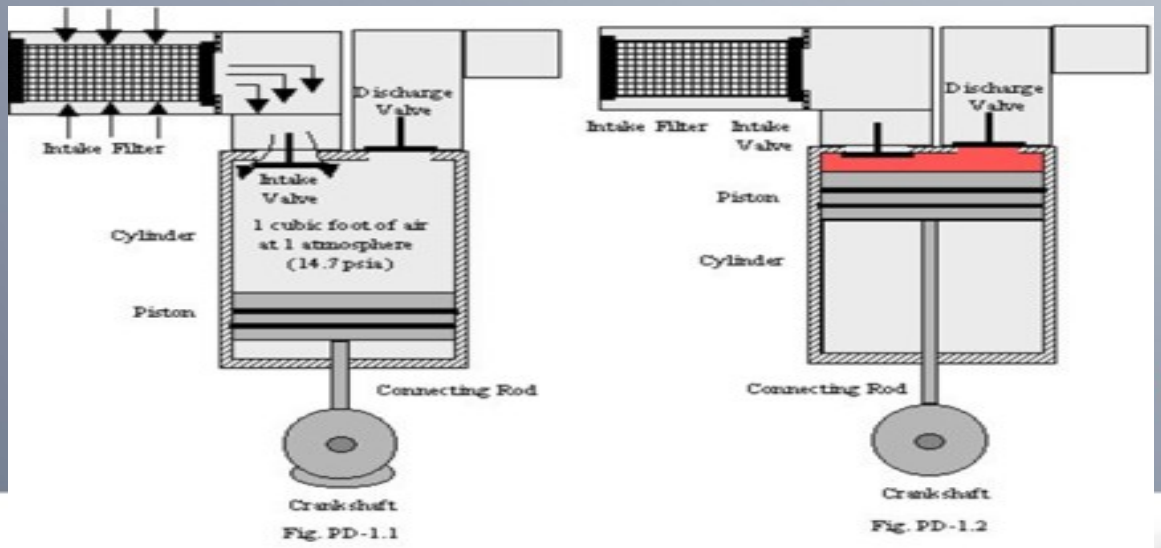


RECIPROCATING COMPRESSORS

- Mechanical piston type
  - Single acting
  - Double acting
  - Diaphragm type

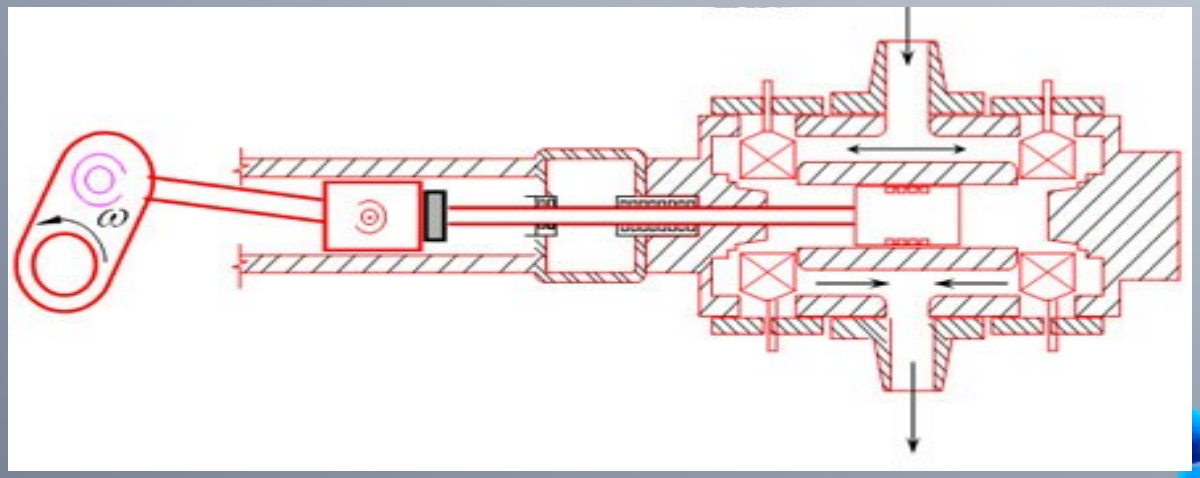
Single Acting Compressor

- A Single Acting Reciprocating (piston) compressor consists of a single cylinder which only takes in and discharges fluid at one end.



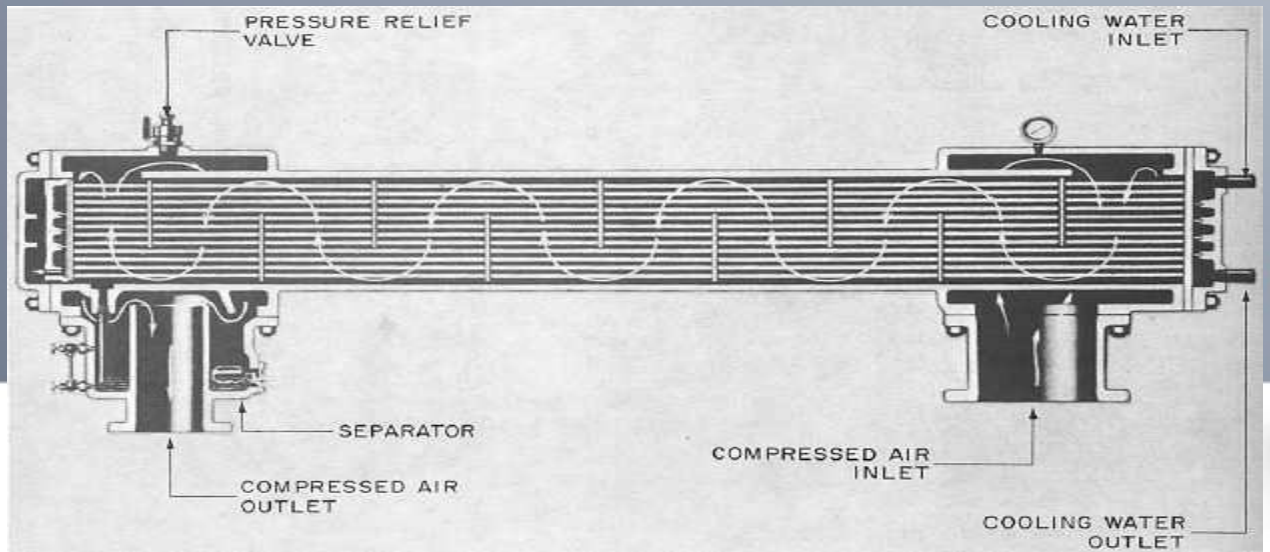
Double Acting Compressor

- A Double acting unit also has only one cylinder but it is piped up to take in and discharge fluid at both ends.



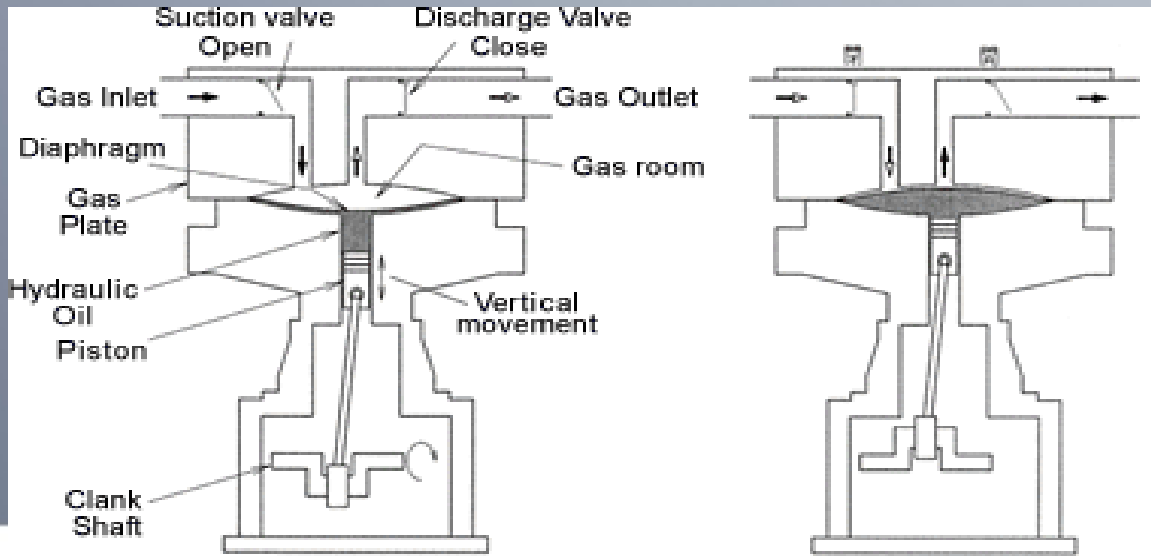
Intercooler in Multi-stage

- An intercooler is any mechanical device used to cool a fluid, including liquids or gases,
- Between stages of a multi-stage heating process, typically a heat exchanger that removes waste heat in a gas compressor

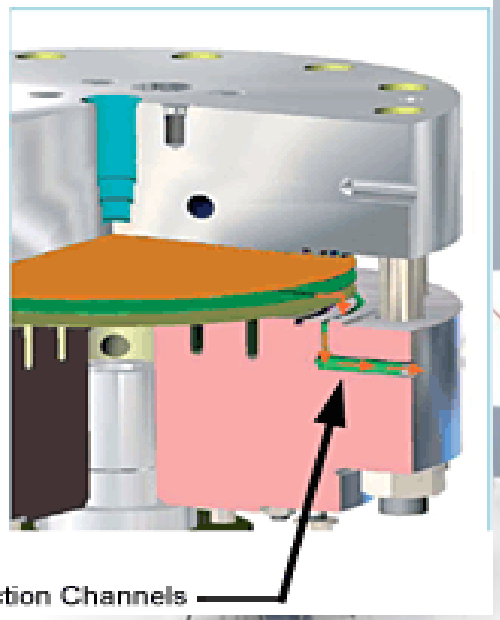


Diaphragm Type

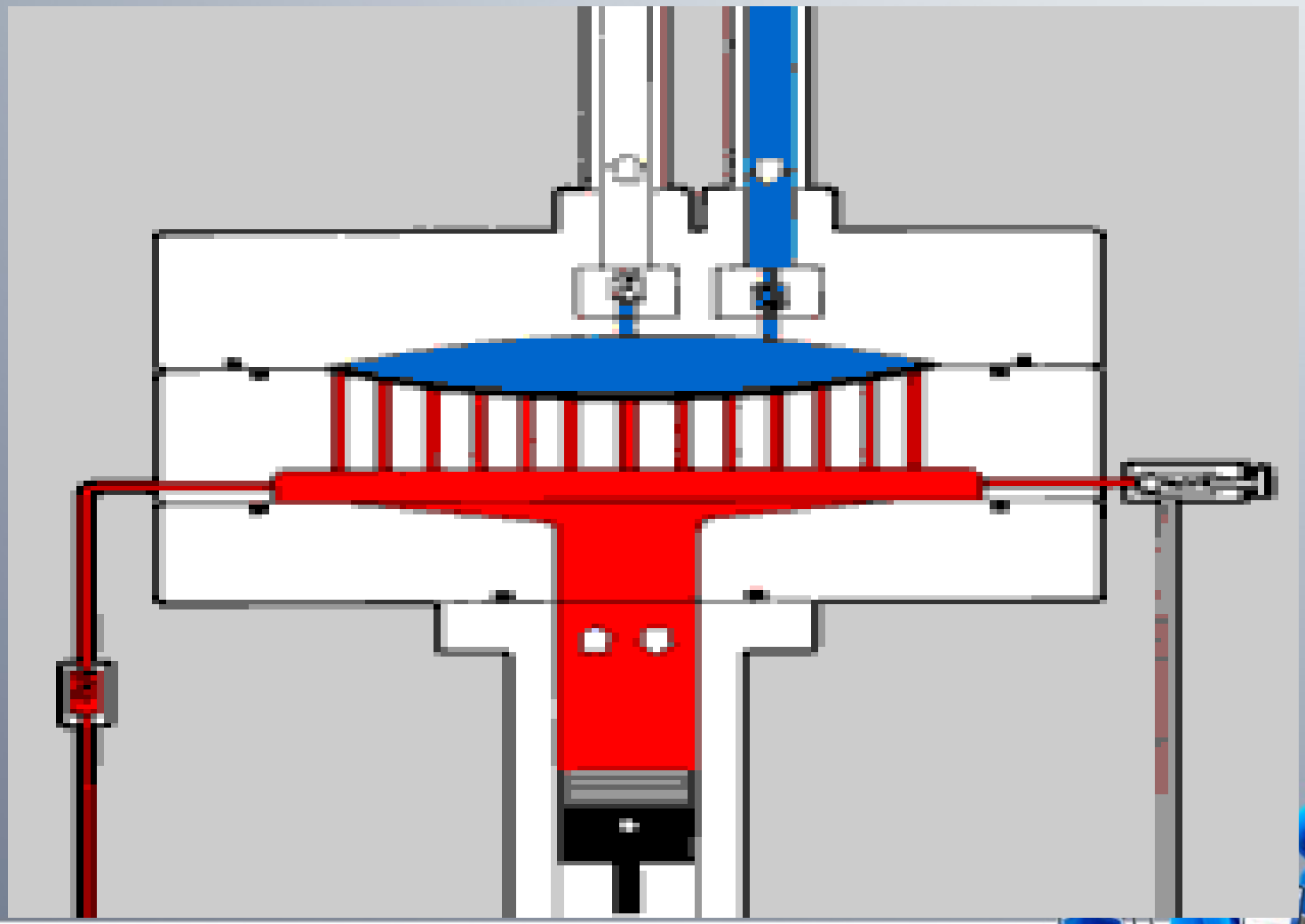
- A diaphragm compressor is a variant of the classic reciprocating compressor.
- The compression of gas occurs by means of a flexible membrane, instead of an intake element.

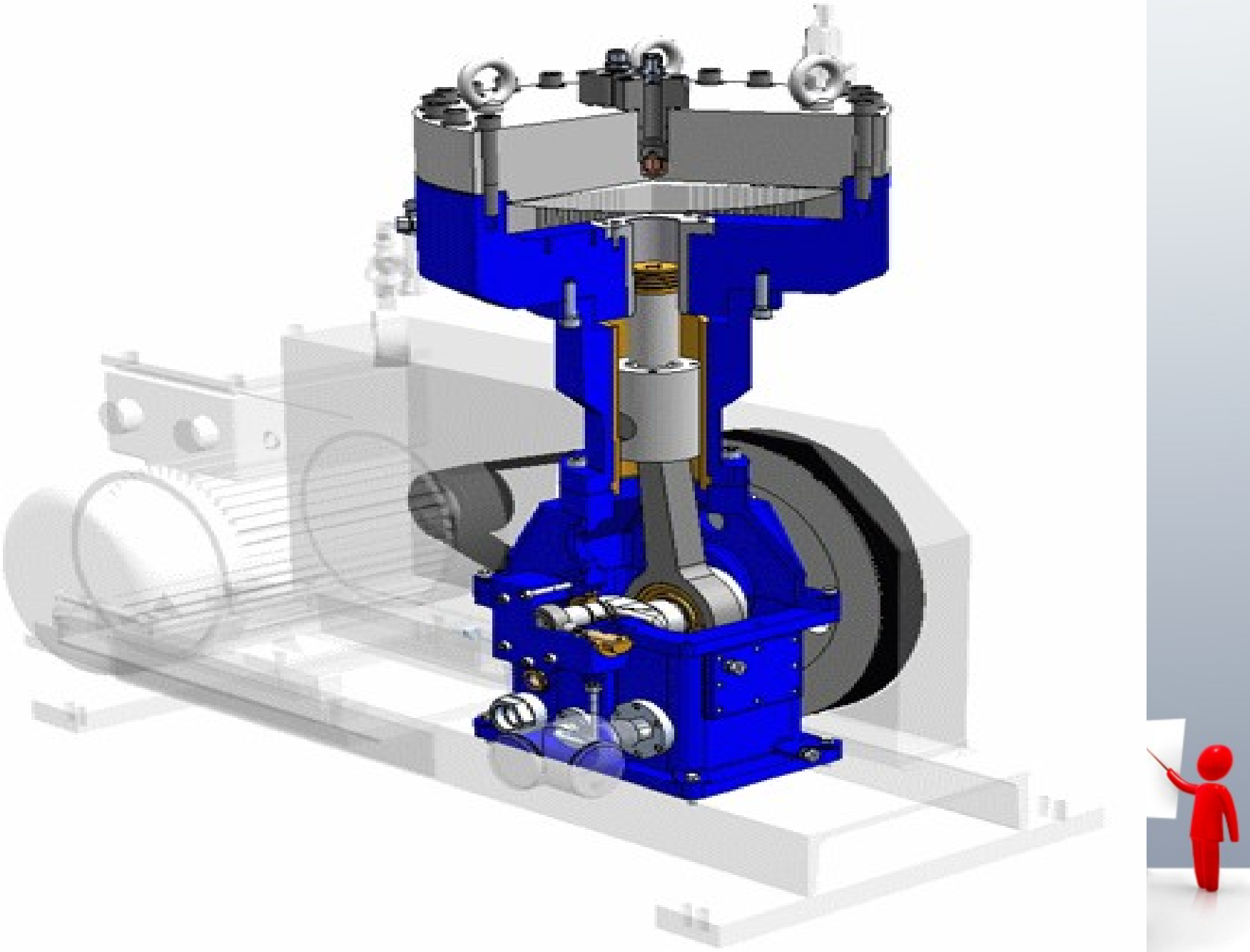


The Head Integrity Detection System



Working





Advantages

- Oil-free compression due to hermetic separation between gas and oil chamber
- Abrasion-free compression due to static seals in the gas stream.
- Automatic shutdown in case of a diaphragm failure prevents damage
- Discharge pressure up to (3,000 bar)

Applications

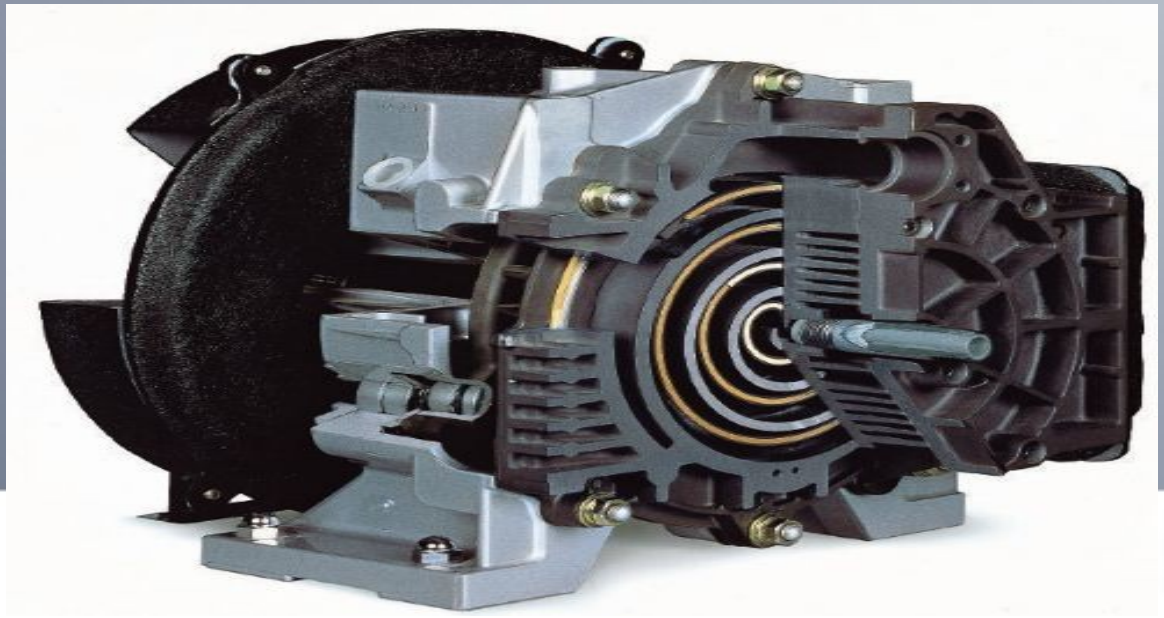
- Automotive industry
- Biogas plants
- Chemical and petrochemical industry
- Chip manufacturing
- Industrial gas manufacturing
- Laboratory and research facilities
- Food industry
- Hydrogen filling stations

Rotary Compressors

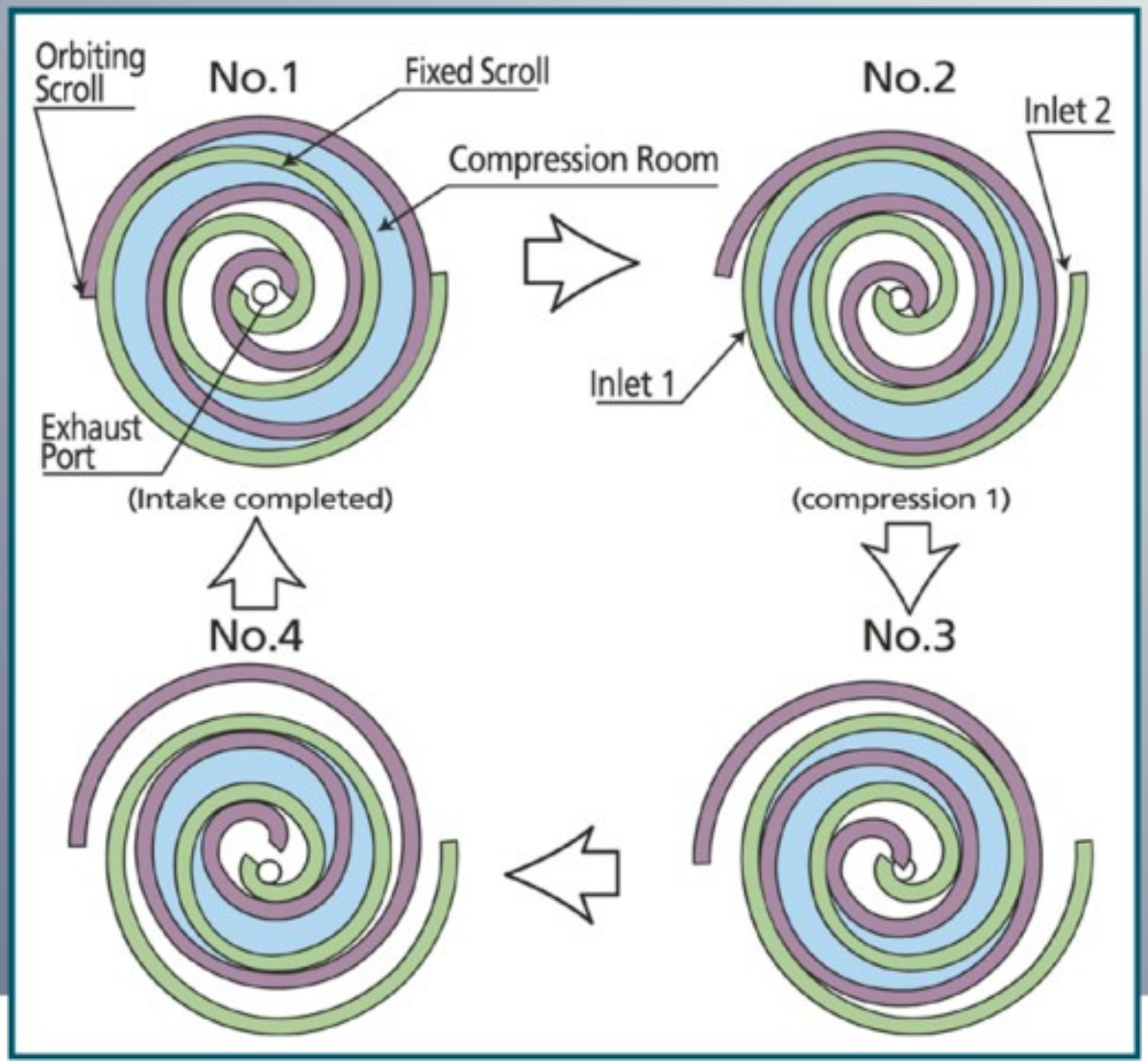
- Rotary compressor function is in which fixed amount of air is displaced with each revolution.

SCROLL TYPE COMPRESSOR

- A scroll compressor operating in reverse is known as a scroll expander, and can be used to generate mechanical work from the expansion of a fluid, compressed air or gas.



WORKING PRINCIPLE



ANIMATION

Advantages of Scroll Compressors

- The absence of pistons for gas compression enables scroll compressors to reach 100% volumetric efficiency, leading to reduced energy costs.
- Re-expansion losses, a typical feature of each piston stroke encountered in reciprocating models, are eliminated. In addition, valve (ports) losses are eliminated,

ADVANTAGES.....

- since suction and discharge valves (ports) do not exist.
- Sroll compressors are considerably quieter in operation compared to other types of compressors, like for example reciprocating type ones.

Disadvantages of Scroll Compressors

- Being fully hermetic, perhaps the biggest disadvantage of scroll compressors is that they are generally not easily repairable. They cannot be disassembled for maintenance.
- ABRATION.....

APPLICATIONS

- Since their introduction, scroll compressors have been successfully used in applications involving food and fruit refrigeration, truck transportation, marine containers as well as residential and small to medium scale commercial air-conditioning applications.

LIQUID RING TYPE

- They are typically used as a vacuum pump but can also be used as a gas compressor.
- The function of a liquid ring pump is similar to a rotary vane pump, with the difference being that the vanes are an integral part of the rotor.

1 **one-stage liquid ring compressors** for compression overloads up to **1.5 bar**

i.e. for: filter-rinsing in the cellulose, pharmaceutical and chemical industries
saturation of sugar juice in sugar factories
electrolysis gases with increased pressure for combustion plants

2 **two-stage liquid ring compressors** for compression overloads up to **3.5 bar**

i.e. for: organic gas reactors and anaerobic processes
gas compression in the production of plastics

3 **two-stage liquid ring compressors** for compression overloads up to **6.5 bar**

with double action second stage [redacted]

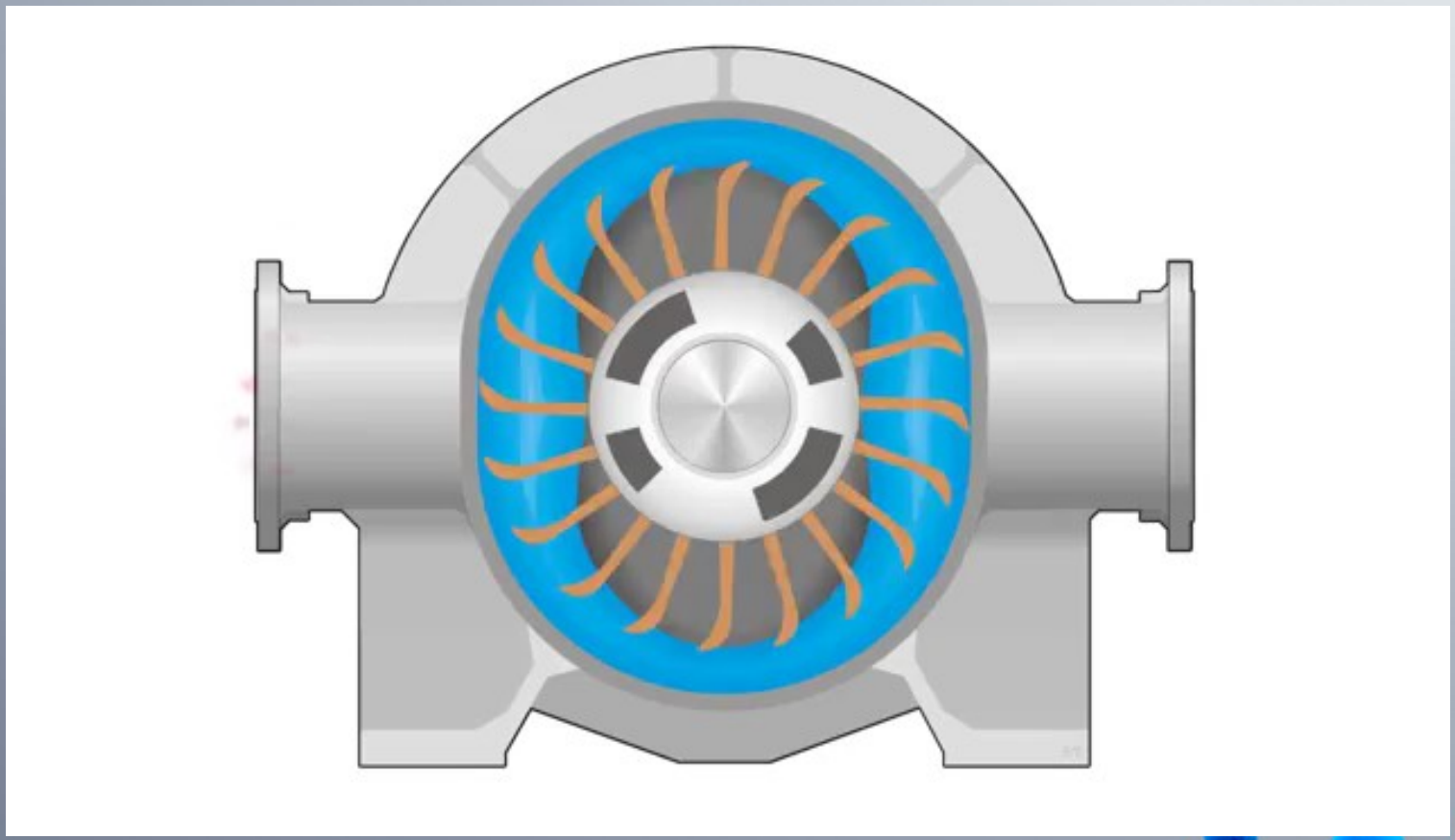
i.e. for: recovery of vapours in the petrochemical field
liquidifying vinyl chloride vapour in the plastics industry

4 **multi-stage liquid ring compressors** for compression overloads up to **11 bar**

predominatly double acting stages

i.e. for: ozone compression in the bleaching of cellolose
exhaust compression in nuclear power stations

ANIMATION



ADVANTAGES

- Almost all gases and vapours are compressed, even those containing dust and liquids.
- there is only a very slight rise in the temperature of the gas
- there is a high level of reliability in service with a minimum of maintenance required

APPLICATIONS

- Applications include breathing air, vent gas boosting/recovery,explosive gas boosting & chemical processes.

thank you!