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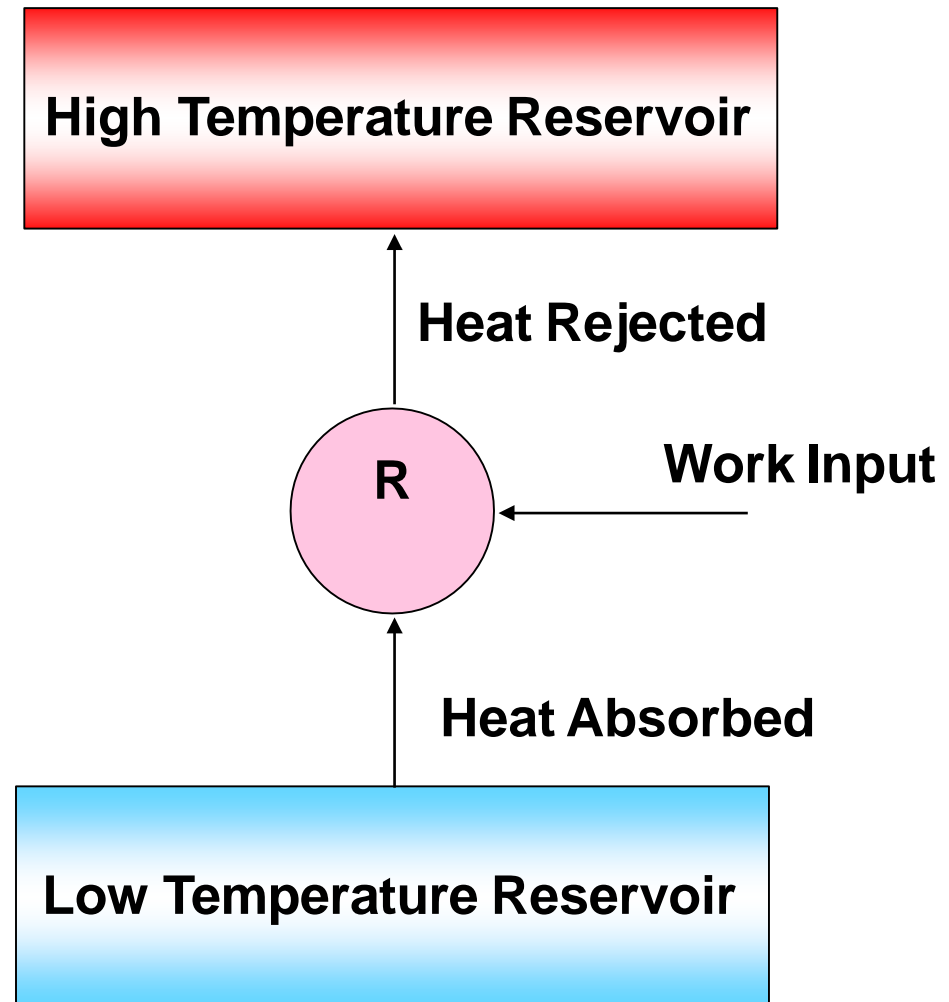
# **Assembly of a refrigeration unit and charging refrigerant**

# Introduction

## Refrigeration & AC

### How does it work?

Refrigeration and air conditioning is used to cool products or a building environment.



# Introduction

## Refrigeration systems for industrial processes

- **Small capacity modular units of direct expansion type** (50 Tons of Refrigeration)
- **Centralized chilled water plants with chilled water as a secondary coolant** (50 – 250 TR)
- **Brine plants with brines as lower temperature, secondary coolant** (>250 TR)

# Types of Refrigeration

## Refrigeration systems

- Vapour Compression Refrigeration (VCR): uses mechanical energy
- Vapour Absorption Refrigeration (VAR): uses thermal energy
- Magnetic Refrigeration: remove heat and maintain low temperature
- Industrial Refrigeration: used in cold storage

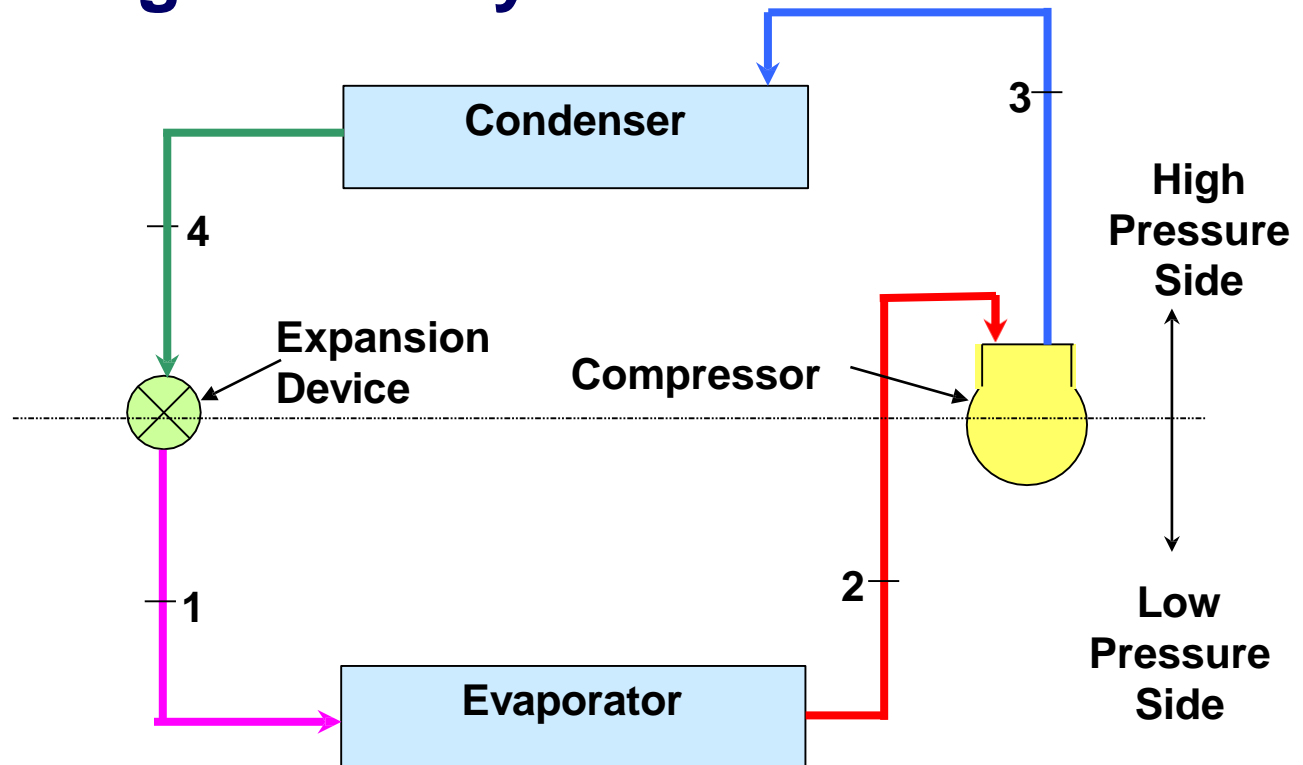
# Type of Refrigeration

## Vapour Compression Refrigeration

- **Highly compressed fluids tend to get colder when allowed to expand**
- **If pressure high enough**
  - **Compressed air hotter than source of cooling**
  - **Expanded gas cooler than desired cold temperature**

# Type of Refrigeration

## Vapour Compression Refrigeration Refrigeration cycle



# Type of Refrigeration

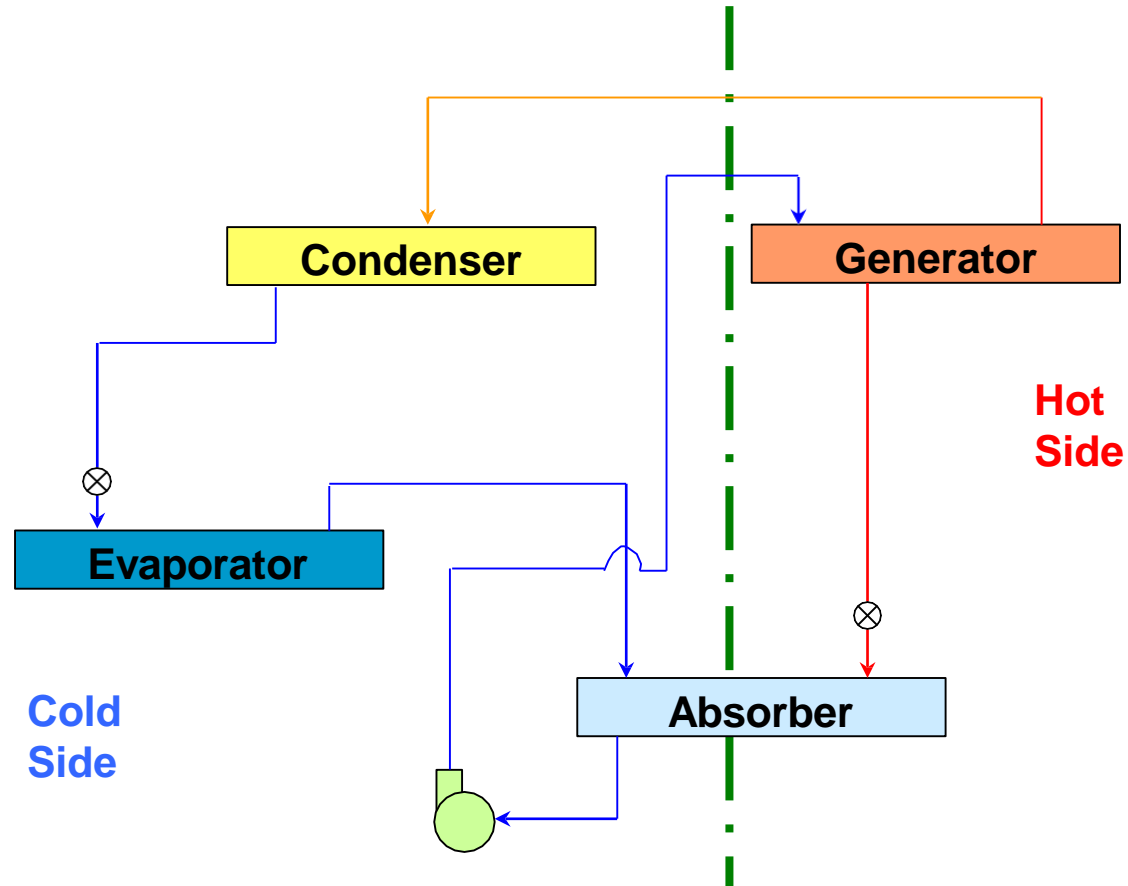
## Vapour Absorption Refrigeration

- The absorption system differs fundamentally from vapour compression system only in the method of employed for compressing the refrigerant.
- In the absorption system, the compressor is replaced by an absorber, generator and a pump.

# Type of Refrigeration

## Vapour Absorption Refrigeration

Refrigeration & AC





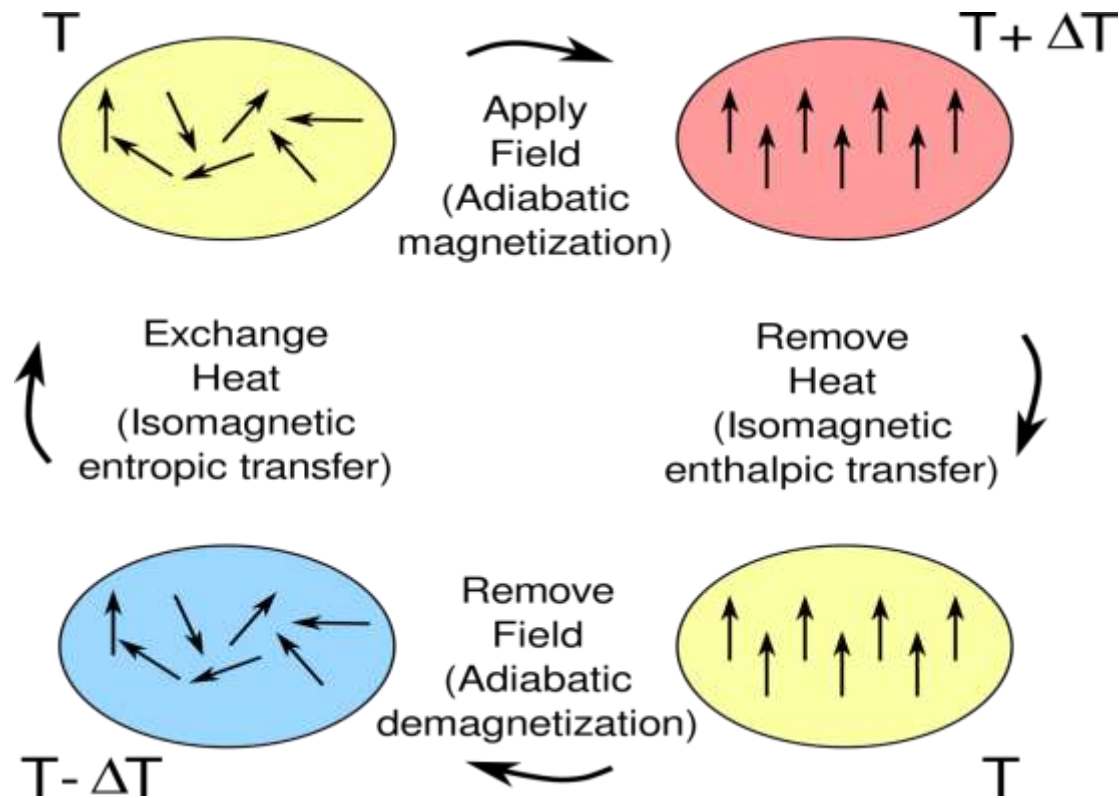
# Type of Refrigeration

## Magnetic Refrigeration

- Magnetic refrigeration is a cooling technology based on the magneto caloric effect.
- It is used to attain temperature well below 1 Kelvin

# Type of Refrigeration

## Magnetic Refrigeration Cycle



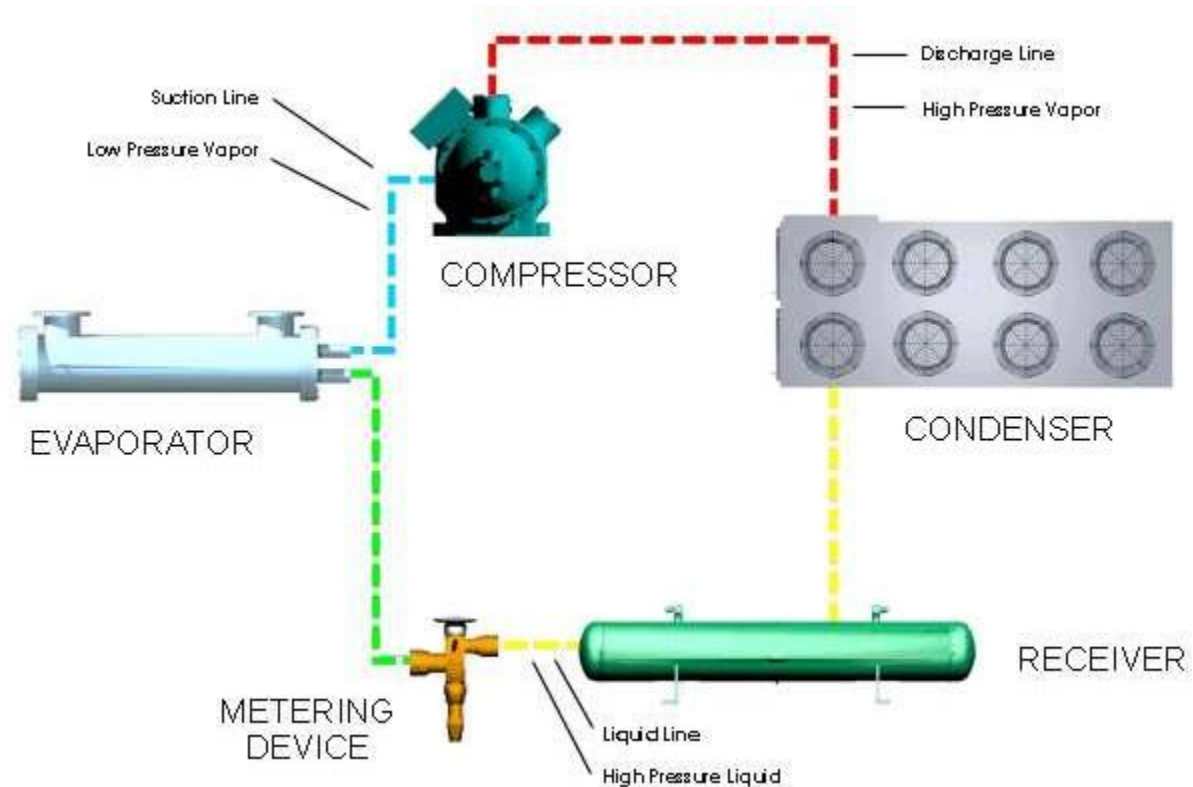
# Type of Refrigeration

## Industrial Refrigeration

- Industrial refrigeration systems for cold storage, process cooling, water chilling, individual quick freezing .
- Up to 500 TR capacity using halocarbon or ammonia.
- Complete with compressors, condensers, all vessels and electrical equipment required

# Type of Refrigeration

## Industrial Refrigeration Cycle



# Types Of Air Conditioner

## Air Conditioning System

- An air conditioning system is an assembly of different part of the system used produce a specified condition of air within a require space or building.
- The basic elements of air conditioning system:--
- Fans : For circulation of air
- Filters : For cleaning air
- Heating Elements : Heating of air(It may be electric heater , steam , hot water.
- Control System : It regulates automatically the amount of cooling or heating.
- Grill : It adjust the direction of the conditioned air to the room.
- Tray : It collects condensed water.
- Refrigerating Plant : provide cooling . It consist of compressor/generator and absorber,eveporator,condensor,expansion device(capallary tube).

# Types Of Air Conditioning Sysytem

## Air Conditioning System

- Window air-conditioning system
- Split air-conditioning system
- Centralised air-conditioning system
- Package air-conditioning system

# Window air-conditioning system

- Window air conditioners are one of the most commonly used and cheapest type of air conditioners
- To install one of these units, you need the space to make a slot in the wall, and there should also be some open space behind the wall.

# Split Air-Conditioning System

- The split air conditioner comprises of two parts: the outdoor unit and the indoor unit
- The *outdoor unit*, fitted outside the room, houses components like the compressor, condenser and expansion valve.



# Centralised Air-Conditioning System

- The central air conditioning plants or the systems are used when large buildings, hotels, theaters, airports, shopping malls etc. are to be air conditioned completely.
- The window and split air conditioners are used for single rooms or small office spaces

# Packaged Air-Conditioning System

- The packaged air conditioners are used for the cooling capacities in between these two extremes.
- The packaged air conditioners are available in the fixed rated capacities of 3,5, 7, 10 and 15 tons.
- These units are used commonly in places like restaurants, telephone exchanges, homes, small halls, etc



**Compressor**



**Condenser**



**Evaporator**

SPLC 系列儲液器  
SPLC SERIES LIQUID RECEIVER



**Receiver**



**Packaged Air Conditioning**



**Centralised Air Conditioning**



**Window Air Conditioning**



**Split Air Conditioning**

# Conclusion

- As the conclusion, we can say that, refrigerator consists with two compartments - one for frozen items and the other for items requiring refrigeration but not freezing.
- It can throw all the heat from the loads inside the compartments and make it cooled and long lasting life. It suitable for application in food and medical industry.

**Thank You**

