

Refrigeration And Air Conditioning

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Refrigeration & Air Conditioning

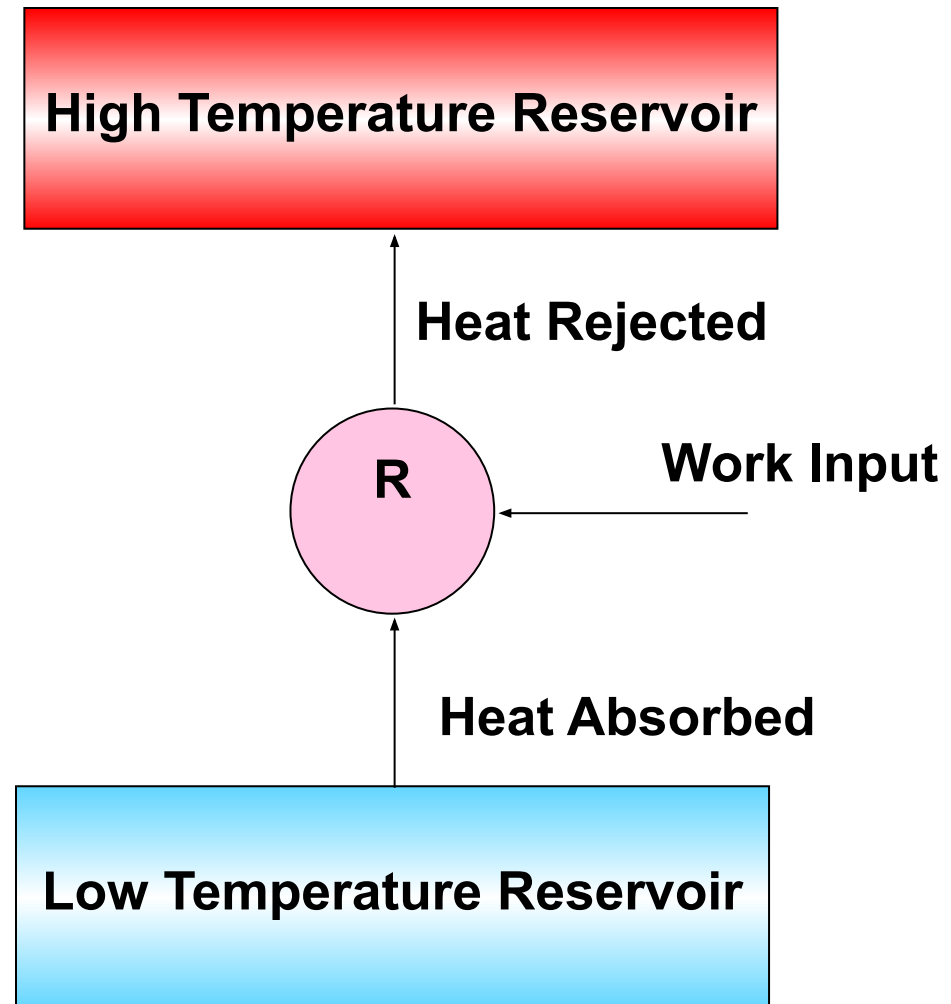
- Introduction
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- Types Of Air Conditioner

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

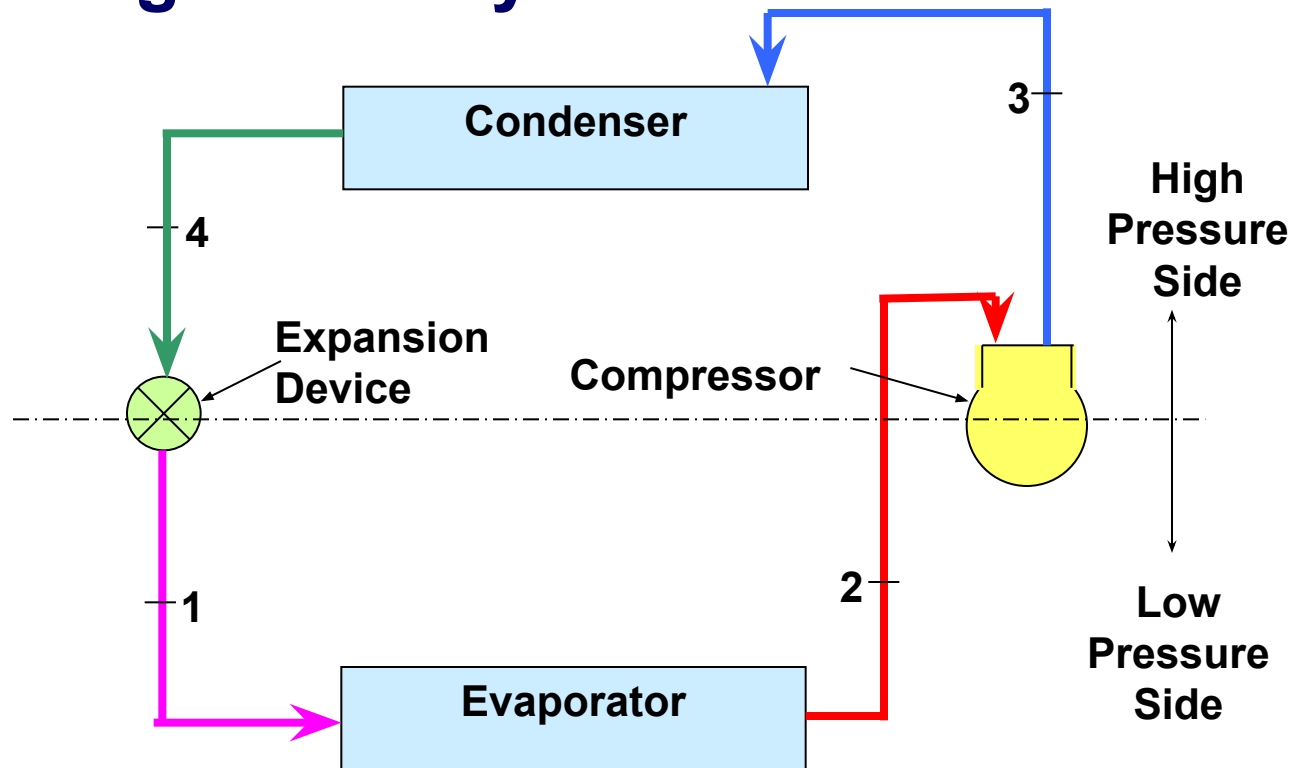
Type of Refrigeration

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

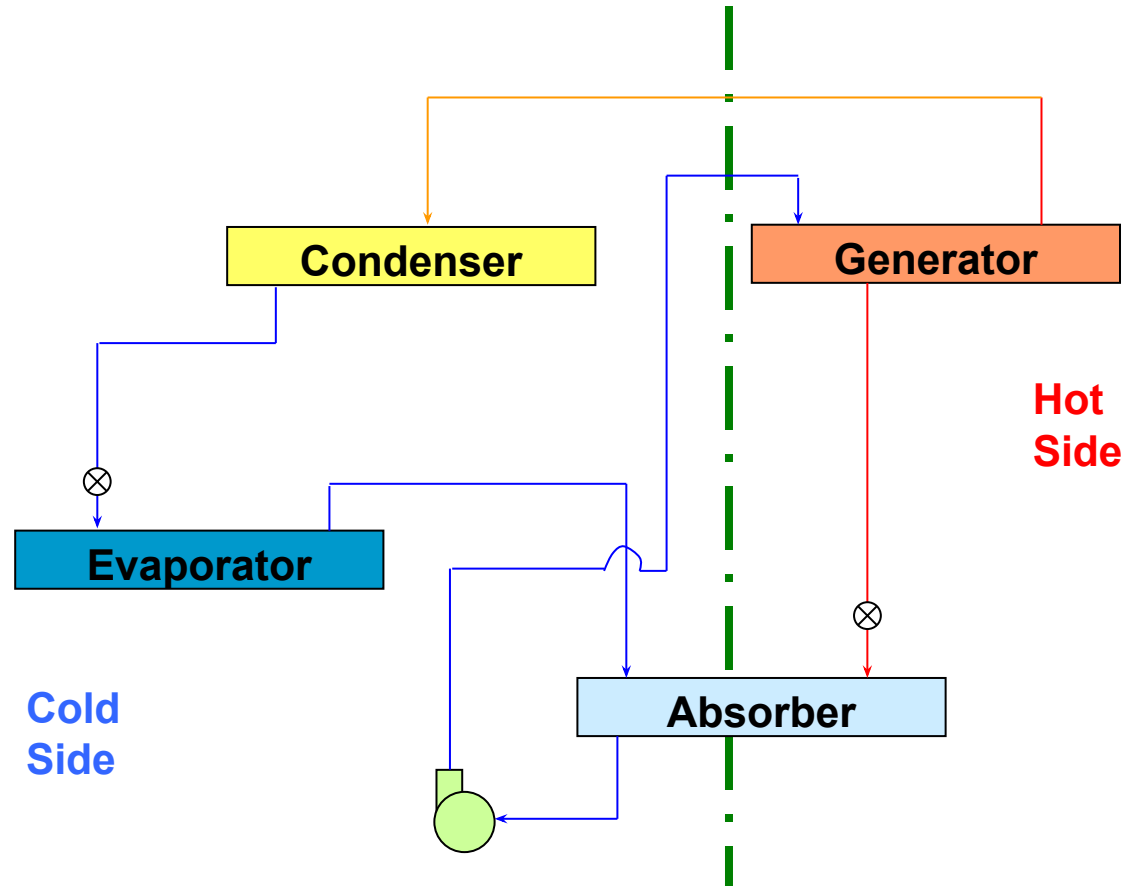
Vapour Absorption Refrigeration

- 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



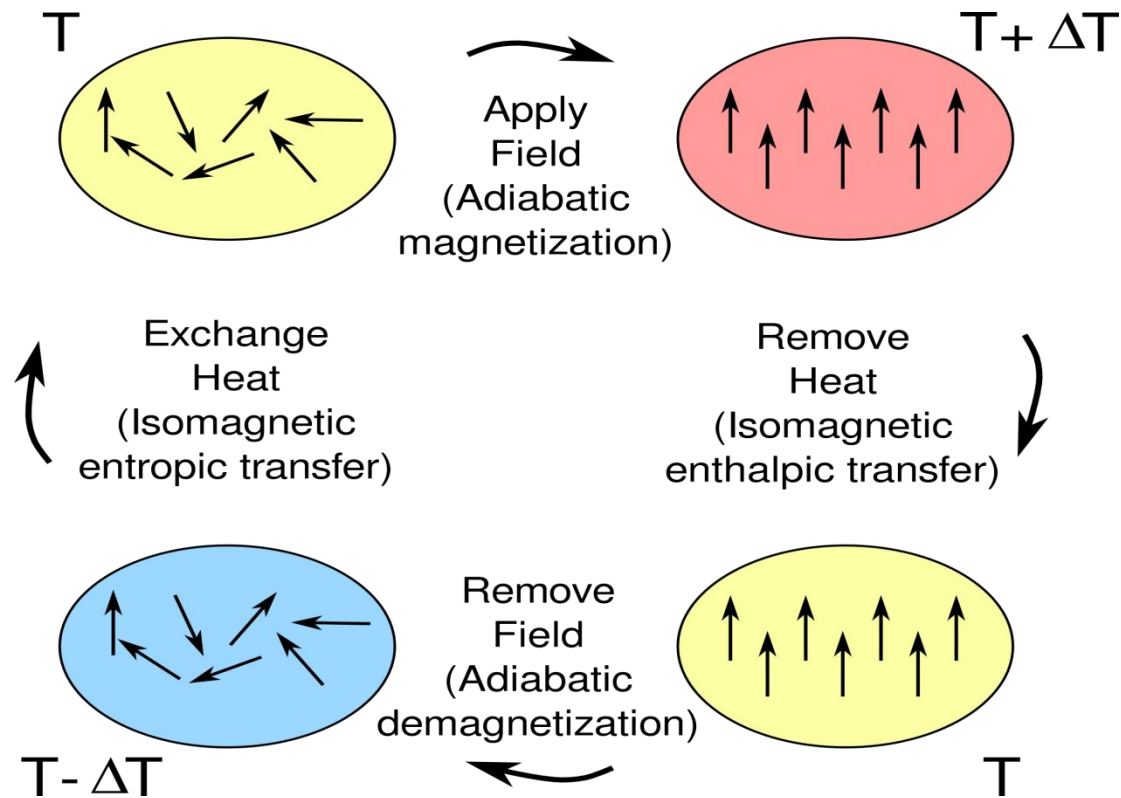
Type of Refrigeration

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



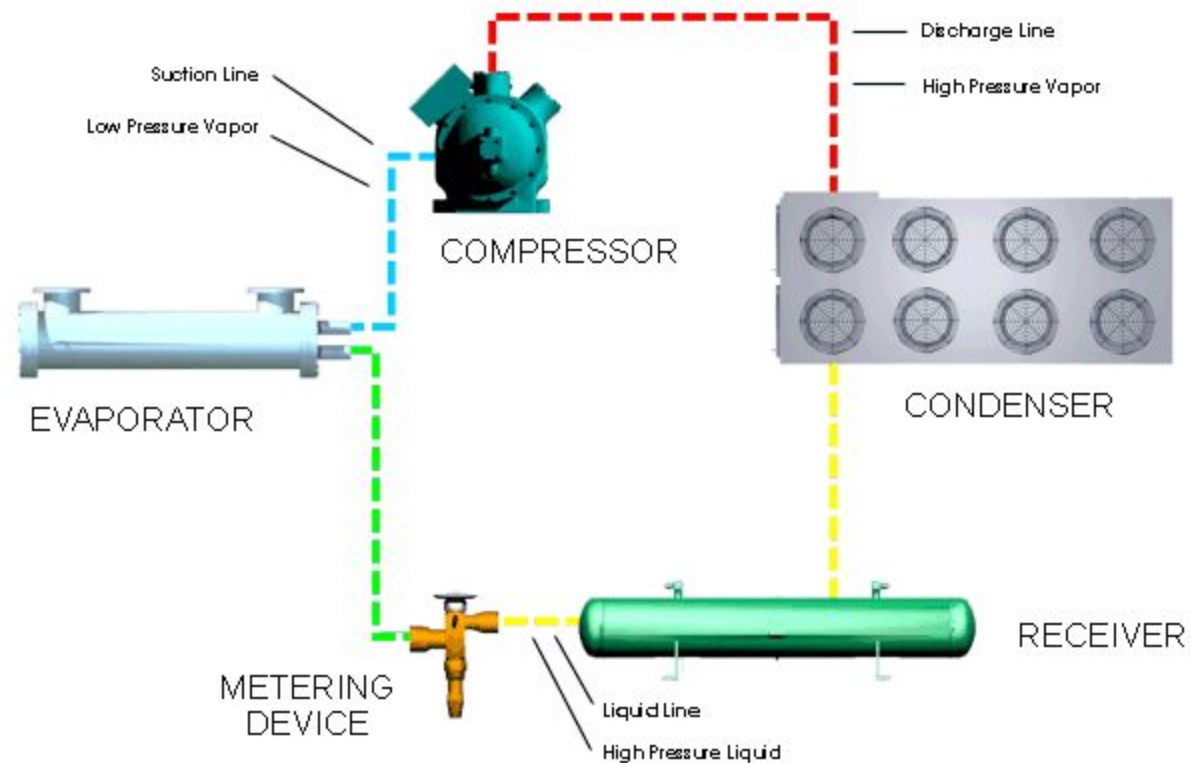
Type of Refrigeration

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

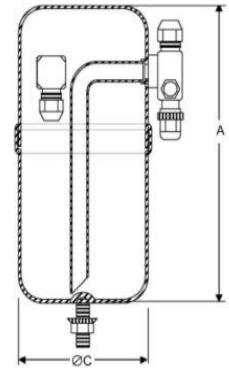


Condenser



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.
- We can also said that the objective of this experiment have been completely achieved as required and at the same time, all the parameters required to be solved have been calculated and solved accordingly. In addition, all of the experiments have eventually being done according to the procedures given systematically and appropriately.

Thank You