



# Labtech HVAC Fundamentals

## Content List

### Vapor Compression Cycle

- Understand basic laws in refrigeration
- Understand refrigeration process in each main component
- Understand vapor compression cycle
- Understand representation of P-H Diagram in vapor compression cycle

### Pressure and Measurements

- Understand definition of pressure and atmospheric pressure
- Understand Boyle's law
- Understand Charles's law
- Understand Gay-Lussac's law

### Heat, Temperature and Measurements

- Familiarization with heat and temperature
- Understand temperature scales and conversions
- Understand heat transfer process by conduction method
- Understand heat transfer process by convection method
- Understand heat transfer process by radiation method
- Understand sensible heat, latent heat and specific heat

### Reciprocating Hermetic Compressor

- Familiarization with refrigerant compressors
- Identification of parts and components in reciprocating hermetic compressor
- Understand construction of reciprocating hermetic compressor
- Understand working principles of reciprocating hermetic compressor

### Evaporator, Air Cooled, Forced Air

#### Introduction of Evaporator

- Double-pipe coolers
- Baudelot coolers
- Tank-type cooler
- Shell-and-coil coolers
- Shell-and-tube chillers
- Direct and indirect systems



## Evaporator, Air Cooled, Forced Air (Continued)

### Evaporator Components

- Evaporator coil
- Fin
- Distributor
- Evaporator inlet
- Evaporator outlet
- Evaporator casing

## Condenser, Air Cooled, Forced Air

- Condenser types in refrigeration systems
- Forced air condenser parts name, locations and their functions
- Heat exchange process in condenser
- States of refrigerant in condenser

## Capillary Tube

### Major component functions

- System unloading
- Critical length and bore of capillary tubes

### Types of capillary tubes

- Applications
- Critical refrigerant charge
- Capillary tube function
- Balance point of compressor and capillary tube
- Size identification of capillary tubes
- Operating pressure

## Thermostatic Expansion Valve (TXV)

- Introduction thermostatic expansion valve
- The diaphragm
- The needle and seat
- The spring
- The sensing bulb and transmission tube
- Types of bulb charge

## Filter Drier

- Know about refrigerant contaminants
- Familiarization with filter drier types and functions
- Understand filter drier parts location and functions
- Understand the application of filter drier



## Receiver

- Familiarize with liquid receiver function
- Understand receiver parts name and functions
- Understand the operation of liquid receiver

## Accumulator

- Familiarize with accumulator function
- Understand accumulator parts name and functions
- Understand the operation of accumulator with heat exchanger coil

## High Low-Pressure Manual Controls

- Familiarize to pressure control in HVAC systems
- Identify the parts and components of manual reset HPC and LPC
- Understand the function of manual reset HPC and LPC for safety purposes
- Understand the operation of manual reset HPC and LPC

## High Low-Pressure Automatic Controls

- Familiarize to pressure control
- Identify the parts and components of HPC and LPC
- Understand the function of HPC and LPC in pressure control system
- Understand the operation of HPC and LPC

## Split Air Conditioning

### Split type air conditioning systems

- Compressor
- Condenser and evaporator coils
- Component description
- AC split outdoor
- Split air conditioner
- Individual room air conditioning systems
- Learning the location of split air conditioning components

## Window Air Conditioning

### Window type air conditioning systems

- Compressor
- Condenser and evaporator coils
- Definition of air conditioning
- Individual room air conditioning systems
- Learning the location of window air conditioning components