

## Purpose & Educational Objective



The **Water Chiller Trainer Unit** is a fully integrated training system designed for the study and demonstration of the **Vapor Compression Refrigeration Cycle** as applied in water chilling applications. It allows users to understand the complete operation of a water chiller, analyze system components, and conduct practical performance evaluations under real working conditions.

This unit is ideal for **engineering colleges, technical institutions, and vocational training centers**, offering comprehensive insight into refrigeration system performance and diagnostics.

### Key Features & Specifications

#### Compressor

- Type: Hermetically Sealed
- Capacity: 0.5–1 TR

#### Condenser

- Type: Air-cooled
- Construction: Copper tubing with aluminum fins
- Cooling: Forced air via fan

#### Evaporator

- Design: Copper coil limpeted in a water jacket
- Insulation: External insulation to prevent heat loss

#### Expansion Device

- Type: Capillary tube

#### Measurement & Monitoring

- **Energy Meter:** For monitoring compressor power consumption
- **Pressure Gauges:** 2 units – for High Pressure (H.P.) and Low Pressure (L.P.)

*Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.*



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measurement

- **Rotameter:** For refrigerant flow rate measurement
- **Voltmeter:** Range 0–250 V
- **Ammeter:** Range 0–15 A
- **Thermostat:** Standard type for temperature control
- **Temperature Sensing:** Set of thermocouples with channel digital temperature indicator

### Control & Protection

- **HP/LP Cut-Out:** For system protection
- **Switches:** Separate switches for compressor and condenser fan operation
- **Service Valve:** Hand shut-off type
- **Filter/Drier:** Installed for moisture and impurity removal

### Scope of Learning

This unit supports hands-on training and experimentation in the following areas:

- Understanding the **working principle and components** of a water chiller and refrigeration system
- Studying the **Vapor Compression Refrigeration Cycle**
- Determining key performance indicators:
  - **Refrigeration Effect**
  - **Work Input**
  - **Actual Coefficient of Performance (C.O.P.)**
  - **Carnot and Theoretical C.O.P.**
  - **Relative C.O.P.**
  - **Ton of Refrigeration**
  - **Overall Plant Efficiency**

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