



Description :

The Refrigerator & Air Conditioner System Trainer is a comprehensive training system designed to demonstrate the fundamental principles of refrigeration and air conditioning technology. It enables students to understand, operate, and analyze both domestic refrigeration and split-type air-conditioning systems using real components, refrigerants, and control circuits. The system includes mechanical refrigeration components, electrical and electronic control panels, intelligent temperature control modules, and full instrumentation for system monitoring. Mounted on a mobile aluminum-steel frame, it provides excellent visibility, accessibility, and safety for laboratory use.

Educational Objectives

- Understand the vapour compression cycle for refrigeration and air-conditioning systems.
- Compare the performance of refrigerator and air-conditioner systems.
- Operate both circuits safely, measuring pressure, temperature, voltage, current, and power.
- Calculate Coefficient of Performance (COP) and Energy Efficiency Ratio (EER).
- Use electronic and mechanical controls to regulate system operation.
- Identify and troubleshoot common faults in compressors, fans, expansion devices, and temperature sensors.
- Perform evacuation, charging, and leak detection procedures.
- Handle real refrigerants (R32 or R134a or R22) safely.
- Connect and disconnect components, tubing, and service ports.
- Operate HVAC instruments and tools for practical experiments.
- Analyze system performance under varying load, ambient conditions, and airflow.
- Develop critical thinking and problem-solving skills in HVAC laboratory exercises.

Technical Specifications

Power Supply Panel

- Input 1PH 220V 10%, with short circuit leakage protection and power indicator
- Output: 2way 220V output socket
- Digital display: 0..250A and 0..5A current indication
- Safety 4mm sockets for power in/out
- Painted Steel panel with stainless steel handles

Airconditioner electrical control

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



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- Sensor: Indoor temperature sensor, pipeline temperature sensor
- Capacitor: indoor/outdoor fan capacitor compressor capacitor
- Working indicator:red, blue, yellow
- Others:push button, 5A fuse etc.
- Painted Steel panel with stainless steel handles

Refrigerator electronic temperature control

- Stimulated indicator: pipeline/laundry, heater, defrost heater
- Sensor: refrigerating/ freezing chamber temperature sensor
- Rotary knob: for temperature setting
- Others:push button, 3A fuse etc.
- Painted Steel panel with stainless steel handles

Refrigerator intelligent temperature control

- Stimulated indicator: defrost heater, compressor
- Stimulated indicator: doorlamp, air door, fan
- Sensor: temperature sensor for each chamber and defrost sensor for refrigerating/varying temp chamber
- LCD display module: w/5mode selection buttons on panel
- Others: toggle switch, 3A fuse etc.
- Painted Steel panel with stainless steel handles

Airconditioner system elements

- Compressor: coolants R22 or equivalent, refrigerating capacity 1745W, RLA 3.2
- Indoor heat exchanger (evaporator) : fan motor 220V, 50Hz, input power 10/40w, rated speed 1250/1350 r/min
- Output heat exchanger (condenser) pressure 2.5MPa, area 3.4m, heat capacity 988w
- Four way reversing valve with solenoid coil 220-240V, 50/60I lz, 5w, MOPD1.8MP
- Throttle device, electromagnetic winding 220-240V, 50/60Hz, 4.5/3.5W
- Sight glass: WET80: SGN, DRY 170F
- Valve and filter

Refrigerator system elements

- Refrigerator compressor: 1PH 101W
- Wire Condenser
- Freezing Chamber
- Freezing chamber evaporator
- Refrigerating Chamber
- Refrigerating Chamber Evaporator
- Throttle device
- Sight Glass
- Dry Filter
- Refrigerating system pressure detecting unit provided with four vacuum manometers 0.1-1.8MPa (2pcs), -0.1-3.8MPa (2pcs) for the high/low side pressure measurement of airconditioner/ refrigerator system
- Mobile experiment stand
- Extruded aluminum profiles tabletop for easy placement of refrigerator system
- Extruded aluminum profiles with 4 grooves for skeleton construction Sheet steel for base and three side faces
- Universal and lockable truckles for easy movement
- Connecting lead: high reliable sheathed gun type connecting wire.

Tool Kit :

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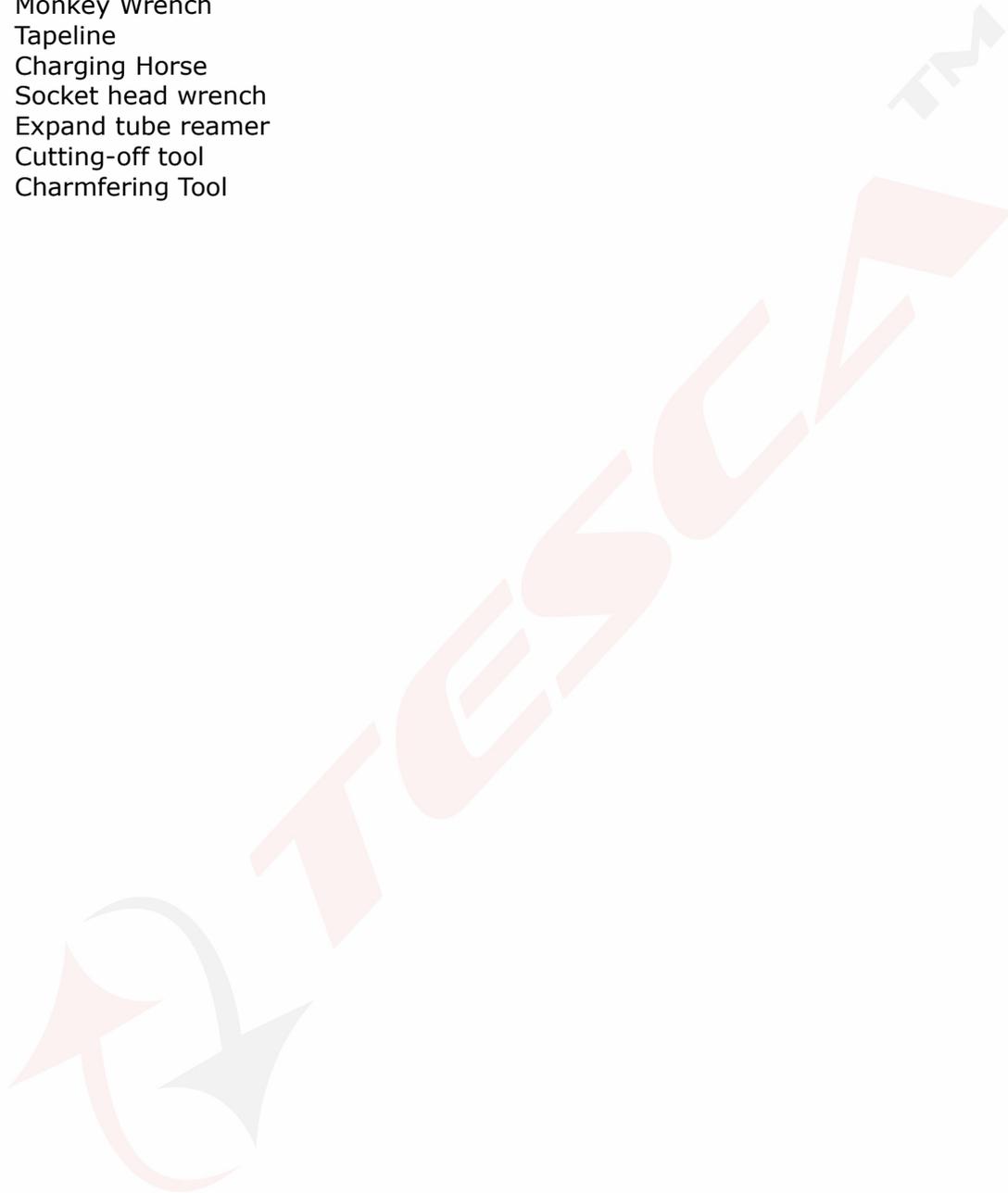
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- Portable welding torch
- Rotary Vane Vacuum pump
- Pipe Bender
- Dual-gauge Valve
- Adapter Suite
- Monkey Wrench
- Tapeline
- Charging Horse
- Socket head wrench
- Expand tube reamer
- Cutting-off tool
- Charmfering Tool



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