

SAP PM TRAINING

Fundamentals

- HVAC Fundamentals
- Basic terminologies in HVAC: TR, COP, EER, SEER, IPLV, Btu, etc
- Concepts of Fluid Mechanics, Heat Transfer, Fluid Flow
- Pressure fundamentals, System Pressures and resistance.
- Modes of heat transfer: Conduction, Convection and Radiation
- Basic Refrigeration cycle
- Equipment familiarization: Compressor, Condenser, Metering device and Evaporator
- Analysis of VCC: Pressure – Enthalpy diagram
- Introduction to Air Conditioning: Comfort and Process applications
- Types of Air Conditioning Systems: All Air, All water, Air – Water and Direct refrigerant systems
- Central and Compact air conditioning systems
- Psychrometry: Psychrometric terms, Psychrometric processes, Use of
- Psychrometric chart

- Calculation of Temperature Difference for Walls, Glass, Roof, Partitions.
- Concept of RSHF, GSHF, ESHF, ADP
- Calculation of dehumidified cfm
- Coil selection
- Case study on load calculation: Manual method and using software

Duct Design

- Industry practices in Duct design and estimation of flow quantities
- Duct design: Manual calculations and by using software
- Duct leakage testing.

HVAC Performance Testing, Adjusting and Balancing (TAB)

1. Introduction to Testing, Adjusting and Balancing (TAB)
2. TAB Air system
 - a) Air Handling Unit: AHU types, Components, AHU testing and Evaluation of Reserve AHU capacity
 - b) Fan: Types, Fan laws, Fan and System curves, Fan testing.
 - c) Measuring Instruments and Limitations
 - d) Measurement of Air flows:
3. TAB Hydronic system
 - a) Pumps: Types, Pump laws, pump and System curves, Pump testing
 - b) Types of pumping system: Primary, Primary-Secondary, Primary-Secondary and Tertiary

Air Conditioning Load calculations:

- Introduction to Air Conditioning load calculations
- Load Estimation methods: Carrier E20, Carrier HAP, ASHRAE RTSM
- Load Components: Sensible and latent
- Building Survey, Outdoor and Indoor Climatic conditions
- Calculation of U factor for Walls, Glass, Roof, Partitions.

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- c) Measurement of Hydronic flows:
- d) TAB Hydronic system: Procedures, Balancing hydronic system
- e) v.Clean room Performance Testing (CPT)
- 1. Introduction to clean rooms, types of clean rooms and their applications

2. Understanding

User Requirement Specifications (URS)

Design Qualification (DQ),

Installation Qualification (IQ),

Operation Qualification (OQ) and

Performance Qualification (PQ)

3. Understanding ISO 14644 Part 3 test Methods)

4. Cleanroom Performance Tests:

Airflow and Air velocity,
Air Pressure Difference,
Installed Filter Integrity test,
Room Particle count test,
Containment leak test,
Light level and Uniformity test, Sound level test, etc.

F. Standards

Various national and international standards related to HVAC
VRF's system for residential & commercial buildings.
Mechanical Ventilation for Car Parking & Basement area, Warehouses & Industrial Ventilation System
HVAC Project planning, bill of materials and specifications