
Interview Round 1

Q1. What is the purpose of a decoupler in a primary-secondary chilled water system?
A: Ensures constant flow through chillers and separates variable flow in the building loop.

Q2. Define TR. How is it related to kW?
A: 1 TR = 12,000 BTU/hr ≈ 3.517 kW.

Q3. What is the ideal velocity range in supply air ducts? A: 1000–1500 FPM for main ducts, 600–1000 FPM for branches.

Q4. Why is insulation applied to chilled water pipes?
A: To prevent condensation and reduce energy loss.

Q5. Explain the function of a volume control damper (VCD).
A: Regulates airflow and balances duct system.

Interview Round 2

Q1. What is the function of a differential pressure sensor? A: Controls VFD pump speed by sensing pressure difference between supply and return.

Q2. Define U-value.
A: Rate of heat transfer; lower U-value = better insulation.

Q3. Difference between DX and VRF system?
A: DX uses direct expansion cooling; VRF uses multiple indoor units and inverter compressors.

Q4. Maximum velocity in chilled water piping?
A: Main: 8–10 ft/s, Branch: 4–6 ft/s.

Q5. How does a VFD save energy?
A: Reduces motor speed and power consumption based on system load.

Interview Round 3

Q1. Minimum slope for chilled water piping?
A: 1:500 to 1:1000 for proper air removal and drainage.

Q2. How to size a chilled water pipe for 300 GPM?
A: Use pipe sizing charts, maintain <8 ft/s velocity, and calculate pressure loss.

Q3. What is PICV?
A: Pressure Independent Control Valve – ensures constant flow to coil regardless of pressure changes.

Q4. What is short cycling?
A: Frequent compressor ON/OFF; causes wear and reduces efficiency.

Q5. Explain coil delta-T.
A: Difference between chilled water supply and return temp across coil; affects system efficiency.

Interview Round 4

Q1. How do you verify an AHU is ready for commissioning?
A: Check installation, filters, valves, access, electrical panel, alignment, and fill checklist.

Q2. What does a BMS actuator do in a VAV system?
A: Modulates damper blade based on temperature or BMS signals.

Q3. How to check flow direction of chilled water on-site? A: Check pipe arrows, touch temperature, and use flow meters.

Q4. What is free cooling?
A: Using ambient air for cooling instead of running chiller, usually via economizer.

Q5. What's in a typical HVAC shop drawing?
A: Equipment layout, duct/piping layout, levels, access, tags, and specifications.

Perfect, Tanweer! Here's the complete Interview Round 5 – Chiller Plant & Control Systems with full questions and model answers — a must-know set for HVAC engineers and technician interviews.

◈ Interview Round 5 – With Full Model

◈ Section 1: Technical Theory

Q1. What is the purpose of a decoupler line in a chiller plant?

✅ Answer:

A decoupler line hydraulically separates the primary (chiller) loop and secondary (building) loop to prevent flow conflict. It ensures constant flow through chillers while allowing variable flow to AHUs and FCUs.

Q2. What's the difference between air-cooled and water-cooled chillers?

✅ Answer:

Air-cooled chillers reject heat through air using condenser fans. No cooling tower needed.

Water-cooled chillers reject heat through condenser water to a cooling tower. More efficient but needs extra infrastructure.

Q3. How does a VFD help in chiller pump systems?

✅ Answer:

A VFD (Variable Frequency Drive) adjusts pump speed based on load. It saves energy, maintains desired flow/pressure, and protects equipment from surges.

Q4. What are the BMS points commonly monitored in a chiller?

✅ Answer:

Chilled water supply & return temperature
CHW flow rate
Chiller ON/OFF status
Alarm conditions
Power consumption
Pressure across evaporator & condenser
Compressor running hours

Q5. Explain delta-T monitoring and why it matters in a chilled water system.

✅ Answer:

Delta-T = Supply temp – Return temp. It shows how much cooling is absorbed.
Ideal delta-T is 5°C to 7°C.
Low delta-T means over-pumping and low efficiency. BMS uses it to optimize chiller and pump operation.

🔷 Section 2: Site-Based Situations

S1. You observe a chiller tripping on high pressure. What will you check?

✅ Answer:

Check condenser water pump operation
Cooling tower fan and temperature
Fouling in condenser tubes
Refrigerant overcharge

Proper airflow if air-cooled chiller

Pressure sensor calibration

S2. The chilled water header temperature is not dropping, even though the chiller is ON. What could be the issue?

✅ Answer:

No chilled water flow due to valve closure or pump issue

Chiller compressor not running despite unit ON

Sensor fault in temperature reading

Excessive load or poor insulation

Faulty chiller logic in BMS

🔷 Section 3: Rapid Fire (1-line answers)

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1. What is the chilled water return temperature range?

➤ Typically 14°C to 17°C (57°F to 63°F)

2. Full form of BMS?

➤ Building Management System

3. What is a chiller plant manager (CPM)?

➤ A BMS software that optimizes operation of chillers, pumps, and cooling towers based on load

4. Name a sensor used to measure chilled water flow.

➤ Electromagnetic or ultrasonic flow meter

5. What is the minimum flow rate required in a chiller loop?
➤ Depends on chiller size, but must be above the chiller's minimum flow rate (e.g., 40–60% of full flow) to prevent low-flow trip

With Full Questions and Model Answers focused on advanced site execution, commissioning, and project handover — commonly asked in supervisor and engineer interviews.

🔷 Interview Round 6 – Execution, Testing & Handover (With Answers)

🔷 Section 1: Technical & Quality Control Questions

Q1. What is the purpose of flushing in chilled water piping before commissioning?

✅ Answer:

Flushing removes dirt, debris, welding slag, and rust from inside the piping to prevent clogging coils, valves, and pumps during operation.

Q2. What is the standard pressure for hydrostatic testing of chilled water piping?

✅ Answer:

Typically, 1.5 times the operating pressure is used.
Example:

If design pressure is 6 bar, testing is done at 9 bar for 2 hours.

Q3. What documents are required before commissioning any HVAC equipment?

✅ Answer:

Approved shop drawings

As-built layout

Manufacturer O&M manual

Pre-commissioning checklist

Pressure test reports

BMS points checklist (if applicable)

Q4. What is a TDS meter used for in cooling towers?

✅ Answer:

TDS = Total Dissolved Solids. The meter measures the amount of minerals/salts in water, which must be controlled to prevent scale formation and corrosion.

Q5. What is the main difference between static and dynamic balancing in HVAC systems?

✅ Answer:

Static balancing: Manually setting flow using balancing valves

Dynamic balancing: Uses PICVs and automatic valves that self-adjust with pressure changes

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◈ Section 2: Real Site Situations

S1. You completed pressure testing, but the consultant rejects it. What could be wrong?

✅ Answer:

No calibration report of gauge

No date/time stamp on test report

Improper test pressure

Pressure dropped during test

No consultant witness or signature

S2. The client requests HVAC handover tomorrow, but AHU BMS control is incomplete. What is your plan?

✅ Answer:

Complete manual testing and record AHU parameters

Submit partial handover with punch list

Inform BMS vendor for urgent completion

Keep temporary manual control in place

Provide commitment date for full automation

◈ Section 3: Rapid Fire (1-line answers)

1. Ideal flushing velocity in chilled water pipes?
➤ 3 m/s to 5 m/s

2. What does a butterfly valve do?
➤ Isolates or regulates water flow in piping systems

3. Name one coil performance test.
➤ Delta-T test (inlet vs outlet water temp)

4. What is an AHU CFM tag?
➤ Indicates the rated airflow capacity of the AHU in Cubic Feet per Minute

5. Who signs the final HVAC commissioning report?
➤ Contractor, Consultant, and Client/Owner

Interview Round 7 – Testing, Sensors & HVAC Electrical

🔷 Section 1: Technical Questions

Q1. What is the purpose of a flow switch in chilled water systems?

✅ Answer:
To detect whether water is flowing. If no flow is detected, it prevents chiller operation to avoid damage.

Q2. What is a differential pressure switch used for in an AHU?

✅ Answer:
It detects pressure drop across filters or fans. If the filter is dirty, the pressure increases and triggers an alarm.

Q3. How does a humidity sensor work in HVAC control?

✅ Answer:

It measures the relative humidity of air and sends the signal to the BMS or thermostat to control humidifiers/dehumidifiers.

Q4. What is the purpose of motorized valves in HVAC systems?

✅ Answer:

They control chilled water flow based on thermostat signals or BMS logic, improving energy efficiency and temperature control.

Q5. Explain the function of a control panel in an HVAC system.

✅ Answer:

It houses electrical protections, starters, VFDs, relays, and wiring to start/stop equipment, manage alarms, and interface with BMS.

🔷 Section 2: Site-Based Situations

S1. An AHU fan motor is not starting, but power is available at the panel. What will you check?

✅ Answer:

Check overload relay

Check contactor status

Verify VFD fault/alarm

Check interlocks (door, fire alarm, flow switch)

Manually test motor continuity

S2. On-site, the BMS shows 0% signal from a temperature sensor. What could be wrong?

✅ Answer:

Sensor wiring loose or cut

Sensor not powered (if active type)

Controller input port failed

Sensor out of range or damaged

🔷 Section 3: Rapid Fire (1-line answers)

1. Which sensor is used to detect air quality?
➤ CO_2 sensor

2. Voltage used in control panels for HVAC?
➤ 230V AC or 24V DC (control circuit)

3. Full form of VFD?
➤ Variable Frequency Drive

4. Which cable type is used for BMS signal?
➤ Shielded twisted pair cable (STP)

5. What is the ideal location for a thermostat?
➤ Room wall, at breathing level, away from air discharge