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COMMISSIONING CERTIFIED TECHNICIAN

CXCT REFRESHER

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MODULE
10L2

Test Airside / Troubleshooting

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In the commissioning phase of HVAC systems, it is crucial to thoroughly test the airside, which includes components like air handling units (AHUs), ductwork, diffusers, and exhaust systems. Proper commissioning ensures that these systems operate efficiently and effectively, meeting design specifications and occupant comfort requirements.

Learning Objectives

- Document Observations & Interpret Basic Terminal Unit Trends.
- Test Airside ,water,control system / Troubleshooting
- Required O&M paperwork and training Preventive maintenancetems
- Retro-commissioning
- Commissioning professional certification & its importance.
- Point-to-point calibrate MEP & sensor systems.
- Green building rating systems & commissioning
- Summary and Resources
- CxCT Practice Exam: Test Your Knowledge!



INTRODUCTION

Understanding the Airside System

- The airside of an HVAC system includes components like air handling units (AHUs), ductwork, diffusers, and exhaust systems.
- Proper commissioning ensures efficient and effective operation of these systems.

TESTING METHODOLOGIES



- Air Flow Measurement: Measures the velocity of air moving through ducts using an anemometer.
- Pressure Testing: Static pressure measurements at various points in the duct system to assess whether the system is operating within designed pressure parameters.
- Temperature Measurements: Assesses the temperature of the air entering and exiting the system to provide insights into the system's thermal performance.
- Humidity Assessment: Measures relative humidity to understand comfort levels and ensure proper dehumidification.

INTERPRETING READINGS

- Deviations from design airflow rates can significantly affect system performance.
- Static Pressure: Readings exceeding designed values may indicate obstructions in the duct system.
- Temperature Differences: Expected temperature differential across coils or filters can reveal inefficiencies in heat exchange processes.
- Humidity Levels: High humidity levels in conditioned spaces can lead to discomfort and mold growth.



TROUBLESHOOTING COMMON ISSUES

- Low Airflow Issues: Check for blocked filters, closed dampers, or undersized ducts.
- High Static Pressure: Evaluate duct design and layout; look for restrictions or leaks.
- Temperature Discrepancies: Assess coil cleanliness, refrigerant levels, and thermostat settings.
- Humidity Control Failures: Investigate air leakage, inadequate ventilation, or malfunctioning dehumidification equipment.





TEST WATER / TROUBLESHOOTING

This topic discusses the importance of testing the water side of HVAC systems during the commissioning phase. HVAC systems often use water as a medium for heat transfer, with components such as chillers, boilers, pumps, piping, and terminal units. The water side can be classified based on its function: chilled water systems for cooling and hot water systems for heating



UNDERSTANDING THE WATER SIDE OF HVAC SYSTEMS

- HVAC systems use water as a medium for heat transfer.
- The water side includes chillers, boilers, pumps, piping, and terminal units.
- The water side can be classified based on its function: Cold Water System for cooling and Hot Water System for heating.



TESTING WATER SYSTEMS



- System components are evaluated to ensure they operate within specified parameters.
- Key aspects include flow rate measurement, temperature differential, pressure measurement, and water quality testing.
- Flow rate is crucial for determining system efficiency.
- Temperature differential is a vital indicator of performance.
- Pressure measurement helps identify issues related to pump performance and system resistance.
- Water quality testing is critical in preventing corrosion and scaling.

TROUBLESHOOTING BASED ON READINGS

- Symptoms associated with each reading can indicate potential issues.
- Low flow rate, poor temperature differential, and abnormal pressure readings can indicate leaks, blockages, or failing components.
- Data analysis is crucial to understand the correlation between symptoms and system configuration.
- Common solutions include clearing blockages, adjusting valves, and replacing components.





TEST CONTROL SYSTEM TROUBLESHOOTING



UNDERSTANDING TEST CONTROL SYSTEMS

- Test control systems are crucial in various industries, ensuring correct, safe, and efficient execution of processes.
- Commissioning these systems involves thorough testing and troubleshooting to confirm their functionality and performance.



TROUBLESHOOTING PROCESS

- Preparation: Gather all relevant documentation, including system specifications, wiring diagrams, and user manuals.
- Familiarization: Understand the functionality of the test control system, including its operational parameters and expected outputs.
- Observation: Record unusual behaviors, error messages, or alarm conditions.
- Symptom Identification: Clearly define the symptoms of the problem.
- Data Collection: Utilize diagnostic tools to monitor key parameters.
- Logging: Record data over time to identify trends or periodic issues.
- Hypothesis Formulation: Formulate potential hypotheses regarding the cause of the issue.



TROUBLESHOOTING PROCESS +

- Testing Hypotheses: Test individual components in isolation to confirm or refute hypotheses.
- Simulation Conditions: If applicable, simulate the operating conditions to see if the same issue occurs.
- Resolution Implementation: Implement necessary repairs or adjustments.
- Documentation of Changes: Record all changes made to the system for future reference.
- Verification: Conduct tests to verify that the issue has been resolved.
- Continuous Monitoring: Continue to monitor the system after commissioning to ensure long-term stability and performance.





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