Kentucky CTE

Advanced Manufacturing: Industrial Maintenance Technology: Heating and Humidification (for Industrial Maint.) 470363 (2026–2027)

Practice and perform safe shop procedures at all times. 1	1 Practice and perform safe shop procedures at all times. 1
Apply the technical math required for employment opportunities in maintenance. 2	2 Apply the technical math required for employment opportunities in maintenance. 2
Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork. 3	3 Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork. 3
Adjust valves. 4	4 Adjust valves. 4
Check coil resistance of a valve coil. 5	5 Check coil resistance of a valve coil. 5
Test gas valve operation. 6	6 Test gas valve operation. 6
Check the voltage at gas valve operator. 7	7 Check the voltage at gas valve operator. 7
Ch vs.	Skip to main content heck pressure at inlet vs. outlet of gas valve. 8

Perform a regular conversion on a gas valve from natural gas to LP or reverse: low, line voltage, redundant, two-stage, and modulating. 9	9 Perform a regular conversion on a gas valve from natural gas to LP or reverse: low, line voltage, redundant, two-stage, and modulating. 9
Explain the operation of a solenoid valve. 10	10 Explain the operation of a solenoid valve. 10
Explain direct vs. servo regulation. 11	11 Explain direct vs. servo regulation. 11
Identify limited, non-adjustable and adjustable regulators. 12	12 Identify limited, non-adjustable and adjustable regulators. 12
Determine application of gas valves. 13	13 Determine application of gas valves. 13
Differentiate between pilot proving devices. 14	14 Differentiate between pilot proving devices. 14
Explain the operation of flame rod, mercury flame switch, bimetal, and millivolt flame sensors. 15	15 Explain the operation of flame rod, mercury flame switch, bimetal, and millivolt flame sensors. 15
Test and change a thermocouple flame sensor. 16	16 Test and change a thermocouple flame sensor. 16
Test spark ignition modules. 17	17 Test spark ignition modules. 17
Perform safety lockout procedures for burners. 18	18 Perform safety lockout procedures for burners. 18
Measure resistance of a ca op	19 Measure resistance of a cad cell during operation. 19

Skip to main content

Explain the operation of an oil delay valve. 20

20 Explain the operation of an oil delay valve. 20

Identify and install residential heating and cooling thermostats. 21

21 Identify and install residential heating and cooling thermostats. 21

Test a fan/limit control to identify a set point of control. 22

22 Test a fan/limit control to identify a set point of control. 22

Wire a complete heating system—line and low voltage. 23

23 Wire a complete heating system—line and low voltage. 23

Identify controls for heating and cooling. 24

24 Identify controls for heating and cooling. 24

Wire a humidistat into electrical circuit. 25

25 Wire a humidistat into electrical circuit. 25

Wire control circuit for electronic air cleaner. 26

26 Wire control circuit for electronic air cleaner. 26

Test and adjust the fuel system of furnace. 27

27 Test and adjust the fuel system of furnace. 27

Check the ignition system. 28

28 Check the ignition system. 28

De-rate or change over a gas burner. 29

29 De-rate or change over a gas burner. 29

Adjust burner system to recommended efficiency. 30

30 Adjust burner system to recommended efficiency. 30

Check for proper temperature rise across the furnace. 31

31 Check for proper temperature rise across the furnace. 31

Test all safety controls. 32

32 Test all safety controls. 32

Skip to main content

Set proper air distribution in house. 33

33 Set proper air distribution in house. 33

Remove, install, and adjust blower motor and/or belt. 34

34 Remove, install, and adjust blower motor and/or belt. 34

Clean the pilot assembly. 35

35 Clean the pilot assembly. 35

Adjust the regulator. 36

36 Adjust the regulator. 36

Observe proper draft conditions. 37

37 Observe proper draft conditions. 37

Oil motor(s) and bearings. 38

38 Oil motor(s) and bearings. 38

Check and adjust the heat anticipator. 39

39 Check and adjust the heat anticipator. 39

Check circulator for alignment and lubrication. 40

40 Check circulator for alignment and lubrication. 40

Set aquastat. 41

41 Set aquastat. 41

Check water-regulating valve operator. 42

42 Check water-regulating valve operator. 42

Inspect/change zone valve operator. 43

43 Inspect/change zone valve operator. 43

Remove air from water system. 44

44 Remove air from water system. 44

Wire a multi-zone/multi-pump hydronic system. 45

45 Wire a multi-zone/multi-pump hydronic system. 45

Identify types of hydronic piping sy

46 Identify types of hydronic piping systems. 46

Skip to main content

Test boiler efficiency and clean if necessary. 47	**47 Test boiler efficiency and clean if necessary.** 47
Oil motor(s). 48	**48 Oil motor(s).** 48
Check and adjust the heat anticipator. 49	**49 Check and adjust the heat anticipator.** 49
Perform pressure checks on the fuel system. 50	**50 Perform pressure checks on the fuel system.** 50
Perform pressure checks on the venting system. 51	**51 Perform pressure checks on the venting system.** 51
Measure temperature difference across heating and cooling equipment. 52	**52 Measure temperature difference across heating and cooling equipment.** 52
Adjust individual register outlets to properly balance system. 53	**53 Adjust individual register outlets to properly balance system.** 53
Describe the reasons for codes. 54	**54 Describe the reasons for codes.** 54
Discuss three model codes: boca, standard, and uniform. 55	**55 Discuss three model codes: boca, standard, and uniform.** 55
Identify the codes and standards for the applicable area, locality, or state. 56	**56 Identify the codes and standards for the applicable area, locality, or state.** 56
Discuss the relationship between codes and manufacturers' installation instructions. 57	**57 Discuss the relationship between codes and manufacturers' installation instructions.** 57
Ide co Skip to main content	**Identify standards not covered by codes: ARI (Air-Conditioning and Refrigeration Institute), ASHRAE (American Society of Heating, Refrigeration, and Air**

(Air-Conditioning and Refrigeration Institute), ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers), and SMACNA (Sheet Metal and Air Conditioning Contractors National Association). 58	Conditioning Engineers), and SMACNA (Sheet Metal and Air Conditioning Contractors National Association). 58
Demonstrate good customer relations in a classroom situation. 59	59 Demonstrate good customer relations in a classroom situation. 59
Explain the importance of manufacturers' installation and operation requirements. 60	60 Explain the importance of manufacturers' installation and operation requirements. 60
Determine equipment electrical requirements. 61	61 Determine equipment electrical requirements. 61
Verify equipment airflow and distribution requirements. 62	62 Verify equipment airflow and distribution requirements. 62
Check operation of all electrical control components. 63	63 Check operation of all electrical control components. 63
Check operation of gas train components and measurements. 64	64 Check operation of gas train components and measurements. 64
Demonstrate use of tools and instruments. 65	65 Demonstrate use of tools and instruments. 65
Check oil burner components and measurements. 66	66 Check oil burner components and measurements. 66

Skip to main content

Check ignition systems while following all safety principles. 67

67 Check ignition systems while following all safety principles. 67

Evaluate fuel supply systems. 68

68 Evaluate fuel supply systems. 68

Test for proper combustion. 69

69 Test for proper combustion. 69

Check electrical components for operation and wiring connections. 70

70 Check electrical components for operation and wiring connections. 70

Check for correct heating input and adjust to manufacturers' specifications. 71

71 Check for correct heating input and adjust to manufacturers' specifications. 71

Read and demonstrate an understanding of electrical wiring diagrams. 72

72 Read and demonstrate an understanding of electrical wiring diagrams. 72

Use tools and test equipment appropriately while following safety practices. 73

73 Use tools and test equipment appropriately while following safety practices. 73

Demonstrate an understanding of combustion theory. 74

74 Demonstrate an understanding of combustion theory. 74

Determine air requirements. 75

75 Determine air requirements. 75

Develop a systematic way to diagnose system problems and demonstrate them in class. 76

76 Develop a systematic way to diagnose system problems and demonstrate them in class. 76

De
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system. 77

Skip to main content

Determine cause of failure in a heating system. 77

Identify and describe all possible causes of failure and how to eliminate causes. 78	78 Identify and describe all possible causes of failure and how to eliminate causes. 78
Verify system operation. 79	79 Verify system operation. 79
Write a service report. 80	80 Write a service report. 80
Measure chimney draft with a draft gauge. 81	81 Measure chimney draft with a draft gauge. 81
Perform an efficiency test on an oil-gas burner: smoke test, CO2 test, and 02 test. 82	82 Perform an efficiency test on an oil-gas burner: smoke test, CO2 test, and 02 test. 82
Determine the efficiency of an oil pump using a vacuum gauge and a pressure gauge. 83	83 Determine the efficiency of an oil pump using a vacuum gauge and a pressure gauge. 83
Determine the relative humidity using a sling psychrometer. 84	84 Determine the relative humidity using a sling psychrometer. 84
Measure gas pressure with a U-tube manometer. 85	85 Measure gas pressure with a U-tube manometer. 85