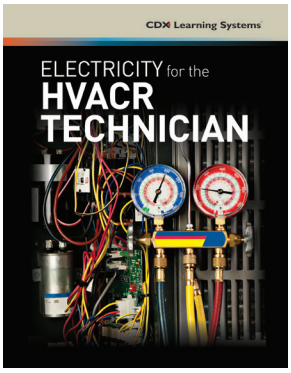

CORRELATION OF

Electricity for the HVACR Technician

to **HVAC Excellence Competency and Task List**

ELECTRICAL

Students should have knowledge of and be able to demonstrate proficiency in:	
Competency	**Chapter No.**
Electrical safety	5
The structure of an atom	1
Direct current	1
Alternating current	1
Positive and negative charged atoms	1
Potential difference	1, 4
Current flow	4
Ohm's Law and solving problems applying to Ohm's Law	4
Watt's Law	1
Series and parallel circuit rules	4
The effects of voltage drop, amps, and resistance in a series circuit	4
The effects of voltage, amps, and resistance in a parallel circuit	4
The effects of voltage, amps, and resistance in a combination series-parallel circuit	4
Impedance and how it effects a circuits	1
Interpreting electrical diagrams	16
Calculating and measuring the voltage output of a transformer using the number of turns on the primary vs. the secondary sides	7
Defining and identifying conductors	1
Describing and identifying insulators	1
Describing and identifying semi-conductors	11
Identifying the types and describing the proper application and use of "circuit protectors"	3
Overload protectors construction and function	3
Evaluating, replacing, and describing the function, application, and wiring of a start capacitor	10
Evaluating, replacing, and describing the function, application, and wiring of a run capacitor	10
The fundamentals of single-phase and three-phase motors	14

CORRELATION OF

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to **HVAC Excellence Competency and Task List**

ELECTRICAL

Competency	Chapter No.
Defining and measuring locked rotor amps, and full load amps	9
Demonstrating and explaining the purpose of checking the resistance of motor windings	14
Describing a dual voltage three-phase motor	14
Describing a dual voltage three-phase motor and demonstrating the wiring configurations	14
Describing a permanent split capacitor motor, a capacitor start induction run motor, and a multi speed motor	14
Describing the operation and characteristics of motor speed drives	14, 15
Describing and demonstrating setup and adjustment of a variable frequency drive (VFD)	
Describing and demonstrating setup and adjustment of a variable speed drive (VSD)	
Describing and demonstrating the method used to change rotation direction in a three-phase motor	14
Describing and explaining motor construction, speed, and rotation for single-phase motors	14
Describing the operation and characteristics of an electronically commutated motor (ECM)	15
Disassembling, assembling, and describing the function of the parts of an induction motor	15
Explaining the difference between a wye and delta three-phase motor	7
Describing the differences between a "pictorial", a "ladder diagram", and a "schematic"	7
Cleaning, evaluating, and installing different types of motors (shaded pole, split phase, PSC, CSR, and ECM)	14,15
Evaluating and installing a run and start capacitor	10, 14
Determining the sequence of operations using schematic wiring diagrams	16, 18, 19, 20
Drawing and interpreting electrical diagrams for the purpose of troubleshooting	16, 18, 19, 20
Installing and evaluating a transformer	7
Installing and evaluating a contactor	9
Installing and evaluating a control relay	8
Installing and evaluating a defrost timer	19
Installing and evaluating a digital thermostat	12
Installing and evaluating a line starter	9
Installing and evaluating a solenoid valve	
Installing and evaluating start relays (current, potential, and solid state)	10
Installing and evaluating temperature coefficient thermistors	12
Identifying electrical symbols used in HVACR schematics	16

CORRELATION OF

Electricity for the HVACR Technician

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ELECTRICAL

Competency	Chapter No.
Identifying inoperative/defective components using schematic wiring diagrams	16, 17, 18, 19, 20
Identifying voltage between two points using schematic wiring diagrams	16
Installing and evaluating a communications thermostat	12
Installing, evaluating, and servicing a dual stage thermostat	12
Servicing and installing equipment control circuits	6, 12
Servicing and installing equipment power supply	6, 16
Identifying the types and describing the proper application and use of common switches use in HVACR	16
Identifying the types and describing the proper application and use of a positive temperature coefficient thermistors (PTC)	10
Describing and demonstrating the proper solder, flux, and procedures for soldering electrical wiring	
Students should have knowledge of and be able to describe and demonstrate the following safety requirements:	
Ladder safety procedures	
Describe and perform "lock out and tag" procedures	5
Identifying the safety ground	1
Identifying the "hot" conductor	3, 6
Identifying the "neutral" conductor	3, 6
Electrical shock prevention and first aid	5
Electrical burns prevention and first aid	5
Describe and demonstrate emergency first aid procedures	5
Knowledge of the following test instruments and/or tools is required:	
Ohmmeter	2
Multimeter	2
Ammeter	2
Voltmeter	2
Wattmeter	2
Hermetic compressor analyzer	
Relay tester	14
Megger meter	14
Capacitor analyzer	2