

Refrigeration Training Services - HVAC/R Electrical Systems CD

Main Topic	#	Subject	Sections	Slide#
E1 Electrical Fundamentals				
E1 S1		<i>Atoms and Electrons, Ohm's Law, Resistance</i>		
		Title Slide		1
	1	Atoms and Electrons		2 -12
	2	Ohm's Law		13-32
	3	Resistance		33-43
	4	Review Questions (22)		44-68
E1 S2		<i>AC and DC Current</i>		
		Title Slide		1
	1	Terms		2
	2	DC Basics		3-4
	3	AC Basics		5-8
	4	Generating AC		9-18
	5	Inductance, Reactance, & Capacitance		19-22
	6	Review Questions (13)		23-37
E1 S3		<i>Meters, Circuits, Loads and Switches</i>		
		Title Slide		1
	1	Meter Types		2
	2	Voltmeters		3-6
	3	Ohmmeters		7-10
	4	Ammeters		11-16
	5	Circuit Resistance		17-18
	6	Series Circuits		19-33
	7	Parallel Circuits		34-51
	8	Series-Parallel Circuit Diagrams		52-59
	9	Review Questions (19)		60-80
E1 S4		<i>Symbols and Wiring Diagrams</i>		
		Title Slide & Intro		1-2
	1	Electrical Loads		3-8
	2	Contactors & Relays		9-22
	3	Switches		23-39
	4	Wiring Diagrams		40-65
	5	Common Diagrams on A/C Units		66-94
	6	Heat Pump Wiring Diagrams		95-110
	7	3-Phase Wiring Diagrams		111-114
	8	9-Led Compressor Diagrams		115-126
	9	Review Questions (17)		127-145

Refrigeration Training Services - HVAC/R Electrical Systems CD

Main Topic	#	Subject	Sections	Slide#
E2 Motors and Motor Starting				
E2 S1		Fan Motors		
		Title Slide		1
	1	Basic Motor		2-5
	2	Motor Starting		6-8
	3	Shaded Pole Motors		9-21
	4	Split Phase Motors		22-26
	5	Centrifugal Switch		27-32
	6	PSC Motors		33-36
	7	Motor Speeds		37-52
	8	Three Phase Motors		53-58
	9	Motor Types		59-63
	10	Motor Mounts		64-70
	11	Motor Nameplates		71-77
	12	Fan Motor FLA		78-92
	13	ECMs		93-114
	14	Motor Service Factor & Efficiency		115-120
	15	Compressor RLA		121-124
	16	Review Questions (31)		125-157
E2 S2		Compressor Relays and Capacitors		
		Title Slide		1
	1	Compressor Starting		2-20
	2	Current Relays		11-20
	3	Adding a Start Capacitor		21-26
	4	Small Compressor Relay & Overload		27-33
	5	Potential Relays		34-41
	6	Run Capacitors		42-49
	7	PTC Relays		50-56
	8	Start Kits		57-82
	9	Making Sense of A/C Start Components		83-114
	10	Review Questions (22)		115-138
E2 S3		Contactors and Motor Starters		
		Title slide		1
	1	Contactors		2-13
	2	Contactor Troubleshooting		14-44
	3	Ratings of Contactors		45-52
	4	Motor Starters		53-60
	5	Review Questions (11)		61-73
E2 S4		Troubleshooting Motors		
		Title and Info		1-3
	1	Basic Fuse Checking		4-5
	2	Meter CAT Ratings & Safety		6-11
	3	Checking Fused Disconnects		12-23
	4	Checking Motor Windings		24-40
	5	Real Life Compressor Problems		41-69
	6	Voltage & Unbalance		70-78
	7	Troubleshooting Capacitors		79-93
	8	Troubleshooting Start Relays		94-103
	9	Fan Blades		104-111
	10	Condenser Motor Troubleshooting		112-124
	11	Review Questions (15)		125-141

Refrigeration Training Services - HVAC/R Electrical Systems CD

Main Topic	#	Subject	Sections	Slide#
E3 HVACR Controls and Devices				
E3 S1		<i>Thermostats and Heating Controls</i>		
		Title Slide		1
	1	Line Voltage Thermostats		2-6
	2	Low Voltage Transformers		7-14
	3	Low Voltage Thermostats		15-28
	4	Communicating Thermostats		29-33
	5	Gas Heating Controls		34-58
	6	Electric Heating Controls		59-63
	7	Thermostat Troubleshooting		64-70
	8	Review Questions (15)		71-87
E3 S2		<i>Relays, refrigeration Controls, and Timers</i>		
		Title Slide & Info		1-2
	1	Contacts, Poles, & Throws		3-16
	2	Relay Switching		17-22
	3	Lockout Relays		23-41
	4	Commercial Refrigeration Controls & Defrost Clocks		42-68
	5	Pressure Controls		69-84
	6	Crankcase Heaters		85-95
	7	Heat Pump Controls & Wiring Diagram		96-102
	8	EEV - Electronic Expansion Valves		103-109
	9	Review Questions (19)		110-130
E4 Electrical Installation				
E4 S1		<i>Power Distributio, Delta and Wye Systems</i>		
		Title slide		1
	1	Power Distributions		2-12
	2	Wye & Delta Configurations		13-18
	3	Buck-Boost Transformers		19-24
	4	Review Questions (8)		25-34
E4 S2		<i>Wire Sizing and Materials</i>		
		Title Slide and Info		1-2
	1	Ampacity		3-6
	2	Wire Marking		7-23
	3	Sizing Wire, Fuses, & Circuit Breakers		24-31
	4	Extension Cords		32-35
	5	Review Questions (8)		36-45
E4 S3		<i>Electrical Panels, Circuit Breakers and Disconnects</i>		
		Title & Introduction Slides		1-4
	1	Electrical Panels		5-8
	2	Neutral and Ground		9-18
	3	Circuit Breakers		19-24
	4	Ground Fault Interrupter		25-36
	5	Hair Drier Experiment		37-45
	6	Arc Fault Interrupter		46-53
	7	Disconnects for Technician Safety		54-63
	8	Lock-Out Tag-Out		64-66
	9	Review Questions (18)		67-86