




United Technologies

turn to the experts 

Carrier University 2018 Training Materials Catalog

Service, Controls and HVAC System Design



Theory, Skills and Equipment Training
for teaching, self-study and presentations



Willis Carrier a sustaining vision

Over 100 years ago, a humble but determined engineer solved one of mankind's most elusive challenges by controlling the indoor environment. A leading engineer of his day, Carrier would file more than 80 patents over the course of his career. His genius would enable incredible advancements in health care, manufacturing processes, research, building capacities, food preservation, transportation, art and historical conservation, general productivity, indoor comfort and much more.

Carrier's foresight changed the world forever and paved the way for over a century of once-impossible innovations. Yet in addition to being an accomplished inventor, he was also an avid outdoorsman. Carrier recognized the power and beauty of the natural environment. This appreciation of our world and its resources continues to guide Carrier Corporation today.

Harnessing the same vision and determination Willis did so many years ago, the men and women of Carrier work every day to accomplish more with less, and preserve resources for future generations. We have a unique willingness to develop new technology, the confidence to revise proven designs, and the ability to deliver results with every new installation.

Above all, we will never rest on our accomplishments, but instead consistently look for ways to improve—our products, our environment and our world.

Willis wouldn't have it any other way.



Willis Carrier was the company's **earliest sustainability leader**. Utilizing precise cooling processes, his invention would enable countless industries to avoid waste and preserve resources for future generations.



institute for
sustainability



Table of Contents

<p>HVAC Theory Training</p> <p>ABCs of Air Conditioning 4</p> <p>GTAC 1 Air Conditioning (Basic Theory)..... 4</p> <p>GTAC 2 Air Conditioning (Applied) 5</p> <p>GTE Electricity (Basic Theory) 6</p> <p>GTH Heating.....6-7</p> <p>Basic Refrigeration Cycles 7</p> <p>Inside the Heat Pump.....7</p> <p>A Guide for Residential Heat Pumps..... 7</p> <p>Servicing Skills</p> <p>HVAC Service Handbooks 8</p> <p>NATE..... 8</p> <p>Service Six Pack 1 and 2..... 9</p> <p>Cooling Skills Programs 10</p> <p>Heating Skills Programs 10</p> <p>Troubleshooting Series..... 11</p> <p>Standard Service Techniques..... 11</p> <p>Computer-Based Training 12</p> <p>Equipment Training 13</p> <p>General Service Training</p> <p>Servicing Compressors 14</p> <p>Safety Training 15</p> <p>Indoor Air Quality..... 15</p>	<p>Controls Training</p> <p>Control Skills 16</p> <p>Design Training</p> <p>Technical Development Programs..... 17-22</p> <p>Residential Design Guides 23</p> <p>Carrier System Design Manual..... 24</p> <p>Process Refrigeration..... 25</p> <p>Engineering Guides25-26</p> <p>Engineering Forms 26</p> <p>Engineering Charts.....27-28</p> <p>Engineering Software 28</p> <p>General Training Materials</p> <p>Professional Development..... 29</p> <p>Award Certificates 29</p> <p>Tools, Rules, Pocket Cards, etc. 29</p> <p>Ordering</p> <p>Ordering Information 30</p> <p>Order Form 31</p>
--	--



ABCs of Air Conditioning

The ABCs of Air Conditioning is one of several introductory training courses on the basics of HVAC systems. This training course has two major parts. Part 1 has four sections that describe the basic principles of air conditioning systems. In the first section of Part 1 it describes how the ambient environment influences human body comfort. The next section covers the air cycle and how air is used to deliver and maintain comfort. The last two sections of Part 1 cover the refrigeration cycles used to control temperature and humidity. Part 2 covers the types of equipment used in residential and commercial buildings to control comfort conditions. The course is intended for new technicians, sales representatives and other people desiring a better understanding of HVAC topics.

- ★ **NEW** USB (GT16-04) 06-020-419 50.00
- ★ **NEW** Book (GT16-03) 06-020-410 15.00

GTAC 1 Air Conditioning (Basic Theory)

Introduction to Air Conditioning (GTAC1-1)

A basic introduction assuming no previous knowledge of the subject matter. Explains HVAC terminology and basic concepts. The Instructor package includes PowerPoint presentation, narrated self-study with animations, and testing.

- Book Only (GTAC1-101) 022-001 7.75
- †CD-ROM (GTAC1-1CD) 022-040 50.00

- ★ **NEW** Book (GTAC-1S) 06-022-051 7.75
- ★ **NEW** Instructor Packet (GTAC-1IG) 06-022-052 50.00

Temperature and Pressure (GTAC1-2)

Covers heat transfer and temperature/pressure relationships. Introduces the Ph (pressure enthalpy) chart. The Instructor package includes PowerPoint presentation, narrated self-study with animations, and testing.

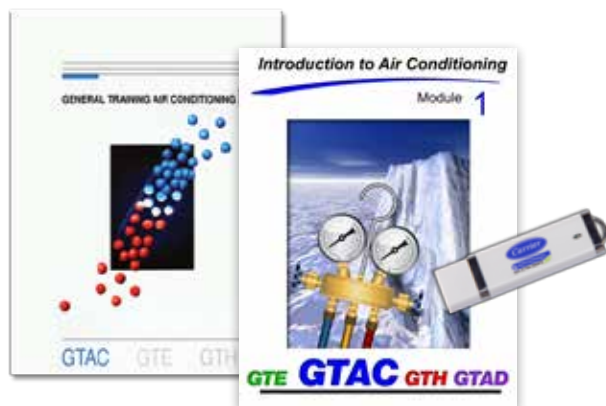
- Book Only (GTAC1-102) 022-003 7.75
- †CD-ROM (GTAC1-2CD) 022-041 50.00

- ★ **NEW** Book (GTAC-2S) 06-022-053 7.75
- ★ **NEW** Instructor Packet (GTAC-2IG) 06-022-054 50.00

The Refrigeration Cycle (GTAC1-3)

Introduces the function of major components and shows how these components work together to constitute the refrigeration system.

- Book Only (GTAC1-103) 022-005 7.75
- †CD-ROM (GTAC1-3CD) 022-042 50.00



Systems (GTAC1-4)

Describes various types of systems along with the compressor/condenser and evaporator curves.

- Book Only (GTAC1-104) 022-007 7.75
- †CD-ROM (GTAC1-4CD) 022-043 50.00

Compressors (GTAC1-5)

Basic types of compressors are introduced, stressing their construction, function, and capacity.

- Book Only (GTAC1-105) 022-009 7.75
- †CD-ROM (GTAC1-5CD) 022-044 50.00

Condensers (GTAC1-6)

Covers operation of condensers within the refrigeration system, condenser capacity and how condenser problems relate to system troubleshooting.

- Book Only (GTAC1-106) 022-011 7.75
- †CD-ROM (GTAC1-6CD) 022-045 50.00

Evaporators (GTAC1-7)

Basic evaporation process is studied. Particular attention is devoted to the process's relationship to the Ph chart.

- Book Only (GTAC1-107) 022-013 7.75
- †CD-ROM (GTAC1-7CD) 022-046 50.00

Metering Devices (GTAC1-8)

Covers the specifics of modulating and fixed orifice refrigerant control. Shows the expansion process and superheat control within the refrigeration cycle.

- Book Only (GTAC1-108) 022-015 7.75
- †CD-ROM (GTAC1-8CD) 022-047 50.00

Electrical & Refrigerant Controls (GTAC1-9)

Introduces the operation and function of basic switches and loads in control and power circuits. Refrigerant flow controls are also covered.

- Book Only (GTAC1-109) 022-017 7.75
- †CD-ROM (GTAC1-9CD) 022-048 50.00

Refrigeration Cycle Accessories (GTAC1-10)

Refrigerant system options and accessories are explained. Benefits of these options in terms of enhanced system operation, ease of installation and servicing, and user convenience are stressed.

- Book Only (GTAC1-110) 022-019 7.75
- †CD-ROM (GTAC1-10CD) 022-049 50.00

GTAC-1 Book

Bound copy contains one each of the GTAC-1 books listed here, Modules 1 through 10.

- Book Only (GTAC1-BK) 022-025 58.75

Bundle of 10 CD-ROM Presentations (PowerPoint)

Contains one each of the GTAC-1 CD-ROM presentations listed here, Modules 1 through 10.

- †Set of 10 CD-ROMs (GTAC1-CD) 022-024 500.00



CDs will be converted to USB drives during 2018. Check website for media type. www.CarrierUniversity.com

GTAC 2 Air Conditioning (Applied)

Refrigerant Characteristics (GTAC2-1A)

Discusses refrigerant types, characteristics, and oil compatibility of pure azeotropes, and zeotrope blends. It focuses on proper application and safe handling for new, replacement refrigerants used in air conditioning and refrigeration systems.

Book Only (GTAC2-101A).....	022-131	7.75
†CD-ROM (GTAC2-1CD)	022-080	50.00

Refrigerant Oils (GTAC2-2A)

Covers oils used in air conditioning systems and how they are properly applied. Includes compatibility with new, replacement refrigerants and changeout procedures.

Book Only (GTAC2-102A).....	022-133	7.75
†CD-ROM (GTAC2-2CD)	022-081	50.00

Refrigerant Piping (GTAC2-3)

Familiarizes you with enough detail to spot and modify obvious field piping errors. Topics covered are piping requirements, sizing, insulation, and support and piping loops.

Book Only (GTAC2-103A).....	022-105	7.75
†CD-ROM (GTAC2-3CD)	022-082	50.00

System Dehydration (GTAC2-4)

Discusses moisture problems and their effect on air conditioning systems, and the importance of moisture elimination during evacuation.

Book Only (GTAC2-104).....	022-107	7.75
†CD-ROM (GTAC2-4CD)	022-083	50.00

Charging, Recovery, Recycling and Reclamation (GTAC2-5A)

Explains how to charge, recover and recycle traditional and replacement halocarbon refrigerants. It also focuses on tools and equipment used.

Book Only (GTAC2-105A).....	022-139	7.75
†CD-ROM (GTAC2-5CD)	022-084	50.00

Installation Procedures (GTAC2-6)

All facets of refrigeration system installation are covered including planning, piping, brazing, wiring, pump down, prestart checks, and start-up and safety essentials.

Book Only (GTAC2-106).....	022-111	7.75
†CD-ROM (GTAC2-6CD)	022-085	50.00

Heat Pumps (GTAC2-7)

Covers the overall concept of the heat pump, its operation, benefits and disadvantages, operating economics, servicing concerns and how water-source heat pumps are used for heat reclaim in commercial buildings.

Book Only (GTAC2-107).....	022-113	7.75
†CD-ROM (GTAC2-7CD)	022-086	50.00

Part Load (GTAC2-8)

Operating problems often show up at part load rather than at full capacity. These are the problems on which this module focuses, concentrating on the refrigeration cycle.

Book Only (GTAC2-108).....	022-115	7.75
†CD-ROM (GTAC2-8CD)	022-087	50.00

Troubleshooting (GTAC2-9)

Introduces basic refrigeration system troubleshooting. Study diagnostic tools along with troubleshooting, logic, information, and charts.

Book Only (GTAC2-109).....	022-117	7.75
†CD-ROM (GTAC2-9CD)	022-088	50.00

GTAC Troubleshooter

This diagnostic tool helps isolate common residential problems quickly and incorporates both the Basic Symptom Analysis and Refrigerant-side Troubleshooting form used in GTAC-9.

Diagnostic Tool (GTAC2-TS)	022-050	8.00
----------------------------------	---------------	------

GTAC-2 Book

Bound copy contains one each of the GTAC-2 Books listed here, Modules 1 through 9.

Book only (GTAC2-BK).....	022-125	58.75
---------------------------	---------------	-------

Bundle of 9 CD-ROM Presentations (PowerPoint)

Contains one each of the GTAC-2 CD-ROM presentations listed here, Modules 1 through 9.

†Set of 9 CD-ROMs (GTAC2-CD).....	022-089	500.00
-----------------------------------	---------------	--------



An online version is available.

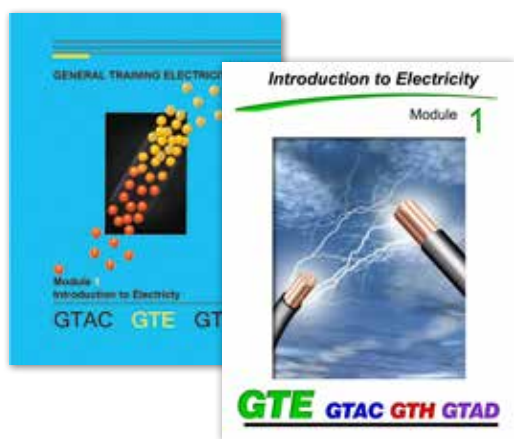
Go to website and find under Training, Online.

www.CarrierUniversity.com.



CDs will be converted to
USB drives during 2018.

Check website for media type.
www.CarrierUniversity.com.



★ **NEW** Student Book*

GTE Electricity (Basic Theory)

Introduction to Electricity (GTE2-1)

Introduces electrical terminology and basic concepts to students with limited knowledge of electricity. Covers Ohm's Law, power, series and parallel circuits. The Instructor package includes PowerPoint presentation, narrated self-study with animations, and testing.

Book Only (GTE2-101).....	022-201	7.75
†CD-ROM (GTE2-1CD)	022-250	50.00

- ★ **NEW** Student Book (GTE-1S)..... 06-022-270 7.75
- ★ **NEW** Instructor Packet (GTE-1IG)..... 06-022-271 50.00

Electrical Components and Their Symbols (GTE2-2)

Introduces basic AC, magnetism, and common electrical components. Begins the coverage of wiring diagrams and their symbols by constructing a very basic circuit diagram.

Book Only (GTE2-102).....	022-203	7.75
†CD-ROM (GTE2-2CD)	022-251	50.00

- ★ **NEW** Student Book (GTE-2S)* 06-022-272 7.75

Wiring Diagrams (GTE2-3)

Discusses safety practices and introduces additional electrical components. Step-by-step construction of a simplified wiring diagram; covering power, control, and load circuits for a typical packaged air conditioner with electric heat.

Book Only (GTE2-103).....	022-205	7.75
†CD-ROM (GTE2-3CD)	022-252	50.00

- ★ **NEW** Student Book (GTE-3S)* 06-022-274 7.75

Wiring Diagram Exercises (GTE2-4)

Covers step-by-step construction of a wiring diagram for a heat pump to teach more advanced diagram-reading skills and control circuit concepts.

Book Only (GTE2-104).....	022-207	7.75
†CD-ROM (GTE2-4CD)	022-253	50.00

Electric Meters and Their Uses (GTE2-5)

Discusses the construction of various types of meters and explains their applications. Sample problems illustrate the use of meters in electrical troubleshooting and testing.

Book Only (GTE2-105).....	022-209	7.75
†CD-ROM (GTE2-5CD)	022-254	50.00

Alternating Current Fundamentals (GTE2-6)

Expands on basic AC concepts covered in Modules 1 and 2 as the basis for understanding AC motors and AC power. Covers basic concepts of motors and generators, capacitors, phase shift, and power distribution systems.

Book Only (GTE2-106).....	022-211	7.75
†CD-ROM (GTE2-6CD)	022-255	50.00

Motor Fundamentals and Motor Protection (GTE2-7)

Covers basic theory and operation of common single-phase and three-phase AC induction motors, including motor starting circuits. Describes the various types of protective devices used with motors.

Book Only (GTE2-107).....	022-213	7.75
†CD-ROM (GTE2-7CD)	022-256	50.00

Electronic Devices and Circuits (GTE2-8)

Discusses basic concepts, packaging, and troubleshooting of electronic circuits used in comfort air conditioning. Covers semiconductors, timing and sensing devices, and the use of microprocessor controls in comfort applications.

Book Only (GTE2-108).....	022-215	7.75
†CD-ROM (GTE2-8CD)	022-257	50.00

Electrical Troubleshooting (GTE2-9)

Describes and illustrates techniques for troubleshooting electrical and electronic circuits with a focus on control circuits and motors.

Book Only (GTE2-109).....	022-217	7.75
†CD-ROM (GTE2-9CD)	022-258	50.00

GTE2 Book

Bound copy contains one each of the GTE2 Books listed here, Modules 1 through 9.

Book Only (GTE2-BK).....	022-225	58.75
--------------------------	---------------	-------

Bundle of 9 CD-ROM Presentations (PowerPoint)

Contains one each of the GTE2 CD-ROM presentations listed here, Modules 1 through 9.

†Set of 9 CD-ROMs (GTE2-CD).....	022-259	500.00
----------------------------------	---------------	--------



GTH Heating

Introduction to Gas Heating (GTH2-1)

Introduces students to four of eight foundation blocks of heating: 1) Heat; 2) Molecules, Heat and Temperature; 3) Heat Transfer; 4) Pressure.

Book Only (GTH2-101).....	022-301	7.75
†CD-ROM (GTH2-1CD)	022-340	50.00

Principles of Gas Combustion (GTH2-2)

Introduces the remaining four foundation blocks of heating: 5) Gas Properties; 6) Combustion Theory; 7) Practical Combustion; and 8) Efficiency.

Book Only (GTH2-102).....	022-303	7.75
†CD-ROM (GTH2-2CD)	022-341	50.00

*New student books are part of an updated program and do not follow the CD.

†CD-ROM or USB contains a PowerPoint presentation which is editable and can be used for instructor-led instruction. Many contain a self-paced version with audio which can be used for individual instruction. Both versions will work with Windows 7 products but this version may not work on some Apple products. To get a version which can be used on learning management systems (LMS) contact www.carrieruniversity.com

Gas Furnaces (GTH2-3)

Students learn basic furnace design, gas system components, furnace controls, and system controls and components.

Book Only (GTH2-103).....	022-305	7.75
†CD-ROM (GTH2-3CD).....	022-342	50.00

Gas Burners (GTH2-4)

Expands on basic concepts. Includes: theoretical flame characteristics; burner design; actual flame characteristics; combustion system; and pilot burners.

Book Only (GTH2-104).....	022-307	7.75
†CD-ROM (GTH2-4CD).....	022-343	50.00

Gas Controls (GTH2-5)

Focuses on controlled combustion process: gas controls; manual and automatic valves; and gas regulators.

Book Only (GTH2-105).....	022-309	7.75
†CD-ROM (GTH2-5CD).....	022-344	50.00

Gas Ignition Systems (GTH2-6)

Explains the three types of ignition systems commonly used: standing pilot; re-ignition pilot; and direct burner ignition.

Book Only (GTH2-106).....	022-311	7.75
†CD-ROM (GTH2-6CD).....	022-345	50.00

Gas Safety & Operating Controls (GTH2-7)

Covers basic theory and operation of common safety controls, operating controls, and system controls used in gas furnaces.

Book Only (GTH2-107).....	022-313	7.75
†CD-ROM (GTH2-7CD).....	022-346	50.00

Furnace Installation Practices (GTH2-8)

Students learn application principles: planning; designing; and selecting equipment, as well as proper gas-piping techniques and installation practices.

Book Only (GTH2-108).....	022-315	7.75
†CD-ROM (GTH2-8CD).....	022-347	50.00

Ventilation & Combustion Air (GTH2-9)

Introduces terminology of Category I vent design basics, vent design and combustion air, as well as Category IV venting and combustion air.

Book Only (GTH2-109).....	022-317	7.75
†CD-ROM (GTH2-9CD).....	022-348	50.00

Gas Troubleshooting (GTH2-10)

Covers basic troubleshooting practices. Covers: basic adjustments; gas input; primary air; efficiency checks; furnace problems; how to identify and correct the operation and function of basic switches and loads.

Book (GTH2-110).....	022-319	7.75
†CD-ROM (GTH2-10CD).....	022-349	50.00

GTH-2 Book

Bound copy contains one each of the GTH Books listed here, Modules 1 through 10.

Book only (GTH2-BK).....	022-325	58.75
--------------------------	---------------	-------

Bundle of 10 CD-ROM Presentations (PowerPoint)

Contains one each of the GTH CD-ROM presentations listed here, Modules 1 through 10.

†Set of 10 CD-ROMs (GTH2-CD).....	022-320	500.00
-----------------------------------	---------------	--------

Basic Refrigeration Cycles

The Basic Refrigeration Cycles is one of several introductory training courses on the basics of HVAC systems. This training course describes the three basic types of vapor compression refrigeration cycles; positive displacement, non-positive displacement and absorption. The operation of the compression used in each cycle is explained and where each type is typically applied. The compressor types covered include scroll, reciprocating, rotary, screw and centrifugal. The training also addresses single and double effect absorption systems. The course is intended for new technicians, sales representatives and other people desiring a better understanding of HVAC topics.

Book (GT56-01A).....	020-528	10.00
†CD-ROM (GT56-03).....	06-020-530	50.00

(This training program has options for self-study or classroom facilitation of Basic Refrigeration Cycles. Student self-study section includes skills checks, remediation, and testing. Instructor may navigate through graphics and control the multimedia features as required.)

- ★ **NEW** Refrigeration Cycle Flow Charts (full color 8.5 X 11)(set of 8 charts) (GT56-08)..... 06-020-53612.00/set
Direct Expansion Air Conditioner, Direct Expansion Heat Pump Heating Cycle, Direct Expansion Heat Pump Cooling Cycle, Packaged Air Cooled Scroll Chiller, Packaged Water Cooled Screw Chiller, Hermetic Water Cooled Centrifugal Chiller, Water Cooled Single-Effect Absorption Chiller, Water Cooled Double-Effect Absorption Chiller
- ★ **NEW** Refrigeration Cycle Posters (full color 24 X 30) (set of 8 posters) (GT56-09)..... 06-020-53415.00/set
Direct Expansion Air Conditioner, Direct Expansion Heat Pump Heating Cycle, Direct Expansion Heat Pump Cooling Cycle, Packaged Air Cooled Scroll Chiller, Packaged Water Cooled Screw Chiller, Hermetic Water Cooled Centrifugal Chiller, Water Cooled Single-Effect Absorption Chiller, Water Cooled Double-Effect Absorption Chiller

★ NEW SUMMER 2018 Basic Air Cycles

A complete air conditioning system must do more than cool the air; it must also circulate, distribute, clean and purify the air as well. These are the functions of the air cycle. This program covers the basic principles of airside including properties of air, air conditioning processes and airside systems, fans and fan laws, filtration, and heating and cooling coils. In addition, basic concepts of air distribution and duct systems, including ventilation basics, are covered. At the end of this program a student will have a better understanding of airside principles and terminology and be better equipped to analyze and troubleshoot airside problems.

- ★ **NEW** Book (GT67-01)..... 06-020-566 10.00
- ★ **NEW** USB (GT67-02)..... 06-020-567 50.00

Inside the Heat Pump

This program includes: theory of operation, components and their function, selection and installation techniques.

Book (GT59-01).....	020-537	10.00
†CD-ROM (GT59-02CD).....	020-539	50.00

A Guide for Residential Heat Pumps

Covers all aspects of residential heat pump installation including load sizing, application and installation.

Book (GT14-01).....	020-417	6.25
---------------------	---------------	------



HVAC Service Handbooks

HVAC Servicing Procedures

No service vehicle should be without it! This rugged, 200-page bound book is designed to be a handy, on-the-job reference. Printed on specially coated wipe-clean paper, it includes four major sections: Instruments and Devices; Safety; General Service Considerations; and Service Procedures; plus a Full Glossary and set of Pressure Temperature Charts. The USB version makes a great instructor's tool with its hypertext and features like quizzes and supplemental reference charts.

Handbook (SK29-01A)..... 020-040 34.00
 USB Drive Hypertext (SK29-01CD)..... 020-039 50.00

HVAC Installation Procedures

Every HVAC installer should have this rugged, 200-page, on-the-job reference book. Printed on specially coated paper, it includes sections on hand and power tools, piping practices, electrical hook-ups and duct installation. Additional sections cover installation of split systems, furnaces, packaged heating and cooling products. Valuable start-up and checkout sheets are included. The hypertext version on CD is an excellent teaching tool and includes additional features such as ductwork sizing, metric conversions, electrical symbols and more.

Handbook (SK32-01)..... 020-038 34.00
 CD-ROM Hypertext (SK32-01CD)..... 020-037 50.00

HVAC Maintenance Procedures Handbook

This reference rounds out our "procedures handbook" trilogy and focuses on practical maintenance techniques. Features the same rugged design as the earlier Servicing and Installation Procedures volumes and is intended to serve as an on-the-job reference. The book's eight sections include well-illustrated, step-by-step maintenance information in the following areas: Preventive, Safety, General, Electrical, Gas Furnace, Oil Furnace, Split and Packaged System and Accessories maintenance.

Handbook (SK35-01)..... 020-093 34.00
 CD-ROM Hypertext (SK35-01CD) 020-094 50.00

NATE Study Guides

Core Study Guide

Review of topics that will be covered in the NATE Core Tests. Core topics include: electricity, including static electricity, simple circuits, circuit parts, use of electrical meters, circuits, electromagnetism; motors; piping; refrigeration; and customer relations.

Book FREE

Air Conditioning Study Guide

Review of topics that will be covered in the NATE Air Conditioning Tests. Air Conditioning topics include: temperature, humidity, air circulation, thermodynamics, meters/gauges, compressors, condensers, evaporators, superheat and subcooling.

Book FREE

Gas Furnace Study Guide

Review of topics that will be covered in the NATE Gas Furnace Tests. Gas Furnace topics include: types of gas heating systems, gas valves, venting, installation, BTU ratings, blower motors, electricity, limit switches, duct construction, thermostat, start-up and checking a gas heater, humidifiers, electric controls and draft.

Book FREE

Heat Pump Study Guide

Review of topics that will be covered in the NATE Heat Pump Tests. Heat Pump topics include: temperature, humidity, air circulation, thermodynamics, meters/gauges, compressors, condensers, evaporators, superheat and subcooling.

Book FREE

Free download at www.CarrierUniversity.com

An online NATE Core Prep Class is also available.
Go to website and find under Training, Online.
www.CarrierUniversity.com.
Study Guides are included with class tuition.



CDs will be converted to USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Service Six Pack 1

One DVD with each of the six basic service skills titles listed below.
DVD (SK20-06DVD) 020-394 150.00



Electrical Troubleshooting

Follows a practical step-by-step path through the complexities of today's electrical circuitry. Graphic and easy-to-grasp, the materials teach the skills needed to find and correct electrical system problems.

Book (SK14-01) 020-057 5.25
†CD-ROM (SK14-02CD) 020-625 50.00

Residential Condensing Unit Replacement

Replacement skills are a must for profitably tapping today's growing replacement market. This program graphically shows the steps for successfully replacing a residential condensing unit.

Book (SK15-01) 020-059 5.25
†CD-ROM (SK15-02CD) 020-626 50.00

Hermetic Compressor Replacement

First, the technician learns how to determine if the compressor has failed, and then he is taken, step-by-step, through a successful replacement procedure. Additionally, start-up and checkout of the system is included.

Book (SK16-01) 020-061 5.25
†CD-ROM (SK16-02CD) 020-627 50.00

Brazing

Brazing is a primary skill for a successful service technician. This module covers the basics of solder alloy types, heat ranges and fuels needed, along with equipment care and safety tips.

Book (SK17-01) 020-063 5.25
†CD-ROM (SK17-02CD) 020-628 50.00

Evacuation and Charging

Often, experienced as well as beginning service personnel do not understand the technique of evacuation and charging. This module shows how to properly evacuate a system. Two methods of charging are presented, as well.

Book (SK18-01) 020-065 5.25
†CD-ROM (SK18-02CD) 020-629 50.00

Air Measurement



Improper airflow often causes comfort system problems. Here, technicians are shown how to measure airflow using the heat rise method. They will gain the skills necessary to successfully troubleshoot system problems.

Book (SK19-01) 020-067 5.25
†CD-ROM (SK19-02CD) 020-630 50.00

Service Six Pack 2

One DVD with each of the six basic service skills titles listed below.
DVD (SK7-06DVD) 020-392 150.00

Metering Devices

Three modern metering devices are shown operating in an air conditioning system. Includes common usage problems and troubleshooting situations.

Book (SK1-01) 020-473 5.25
†CD-ROM (SK1-02CD) 020-631 50.00

Add-On Air Conditioning Installation

This program shows how to install an "Add-On" split system air conditioner. A natural enhancement to the training found in 6-Pack 1.

Book (SK2-01) 020-475 5.25
†CD-ROM (SK2-02CD) 020-632 50.00

Gas Furnace Replacement

Students learn how to remove and replace an existing gas furnace with a mid-efficiency model. Emphasis is on start-up and checkout of the new system.

Book (SK3-01) 020-477 5.25
†CD-ROM (SK3-02CD) 020-633 50.00

Advanced Troubleshooting

This program builds on the training found in the Electrical Troubleshooting 6-Pack 1 presentation. It takes the technician through more complex problems using the proven hopscotch method.

Book (SK4-01) 020-479 5.25
†CD-ROM (SK4-02CD) 020-634 50.00

Electrical Test Instruments

An overview of two of the most-used instruments in the technician's tool kit, the volt-ohmmeter and the clamp-on ammeter.

Troubleshooting situations are emphasized.

Book (SK5-01) 020-481 5.25
†CD-ROM (SK5-02CD) 020-635 50.00

Air Conditioning Tune-Up

Here we cover the steps required to check out and tune up an air conditioning system. These skills will be highly useful in this growing segment of service/maintenance business.

Book (SK6-01) 020-483 5.25
†CD-ROM (SK6-02CD) 020-636 50.00



CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Cooling Skills Programs

Metering Devices – Fixed-Orifice and TXV

This training supports Carrier's residential platform of products that use TXV metering devices in all evaporator furnace coils and fan coils. This training will explain how the metering device operates in an air conditioning system and how the TXV with its variable orifice is able to provide superior system performance.

Book (GT-100).....	06-C20-641	7.75
CD-ROM PowerPoint™ Presentation with Audio (GT-100CD)	
.....	06-C20-642.....	50.00

Charging Procedures for Residential Condensing Units

Covers superheat and subcooling charging methods and procedures for correct system airflow using the Superheat/Subcooling Charging Calculator/Slide Rule.

Book (SK28-01).....	020-122	12.50
Superheat/Subcooling Charging Calculator/Slide Rule (HCFC-22 only)	
(GT24-01).....	020-434	4.00

Proper Condensate Drain Connections

Prevent stained ceilings and ruined furniture caused by backed-up condensate water. Shows how to prevent and eliminate these problems by understanding why they occur, dimensions for drain trap, as well as do's and don'ts of installing condensate drains.

DVD (PCD-02DVD).....	020-263	37.50
----------------------	---------------	-------

Leak Testing Residential and Light Commercial Refrigeration Systems

This basic skills program covers equipment and techniques used to perform refrigerant leak testing in residential and light commercial refrigerant equipment. Safety, environmental and economic concerns are stressed throughout.

Book (SK34-01).....	020-095	7.75
CD-ROM Slide Presentation (SK34-02CD).....	020-097	50.00

Rooftop Operation and Maintenance

Designed to guide building owners and operators through the service and maintenance requirements of packaged heating and cooling systems 3 tons and up. Identifies common problems and stresses planned maintenance and maintenance scheduling. Covers Application and Operation, Installation Pitfalls, Maintenance Schedules and Maintenance functions the owner/operator will perform and Maintenance functions an air conditioning service company will perform.

Book (GT60-01).....	020-540	7.75
†CD-ROM PPT (GT60-02CD).....	020-542	50.00

Rooftop Economizers

Covers different types of economizers and their operation, including the functions of their motors, dampers, and controls.

Book (GT44-01).....	020-504	7.75
†CD-ROM (GT44-02CD)	020-244	50.00

★ NEW SUMMER 2018 Troubleshooting the Economizer

Covers procedures for troubleshooting economizers and a brief review of operation of the major components and controls.

Book (GT45-01A)	020-506	7.75
USB Drive (GT45-01USB)	06-020-529.....	50.00

Rooftop Air Test & Balance

Covers the basics of air balancing for constant volume systems, a look at tools and instruments commonly used and follows through a typical balancing procedure.

Book (GT46-01).....	020-508.....	7.75
---------------------	--------------	------

Leak Testing Liquid Chillers- Reciprocating, Centrifugal and Absorption

Increase awareness of equipment and techniques used to perform refrigerant leak testing in applied equipment. Safety, environmental and economic concerns are stressed. Includes: Importance of leak detection & repair; monitoring equipment; and leak testing waterside components.

Book (SK33-01)	020-079	7.75
†CD-ROM (SK33-02CD)	020-080	50.00

Heating Skills Programs

Condensing Furnace Installation, Start-Up & Checkout

This program takes technicians through various aspects of condensing furnace installation from initial survey of the job, the actual installation and the all-important start-up and checkout procedures.

Book (SK31-01)	020-076.....	12.50
----------------------	--------------	-------

Clocking a Gas Meter

"Clocking" the meter is one of the more commonly used methods for determining if a furnace or any gas-fired appliance is delivering its full rated input. This video shows how to perform this procedure.

DVD (SK36-02DVD).....	020-264	37.50
-----------------------	---------------	-------

Measuring Flame-Sensing Current

Modern gas furnaces use the principle of flame rectification to determine if there is an adequate burner flame for safe operation. This video shows how to determine if the flame-sensing circuits are operating correctly.

DVD (SK37-02DVD)	020-265.....	37.50
------------------------	--------------	-------

Hydronic Heating Systems

Use to plan, size, lay out and install a hydronic heating system in residential and light commercial applications.

Book (GT31-01).....	020-454	7.00
---------------------	---------------	------

Oil Heat

This program covers aspects of oil heat technology that are of interest to persons who install and service oil-fired residential heating products. After an introduction section, oil combustion fundamentals and oil burners are covered. Oil heating system topics include fuel supply systems and proper venting. A section on annual maintenance emphasizes the use of an annual maintenance checklist, which is provided. The troubleshooting section covers commonly encountered system problems.

Book (GT57-02).....	020-535	10.00
†CD-ROM (GT57-01CD)	020-527	50.00



CDs will be converted to USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com

†CD-ROM or USB contains a PowerPoint presentation which is editable and can be used for instructor-led instruction. Many contain a self-paced version with audio which can be used for individual instruction. Both versions will work with Windows 7 products but this version may not work on some Apple products. To get a version which can be used on learning management systems (LMS) contact www.carrieruniversity.com

Troubleshooting Series

Troubleshooting Residential Cooling Systems

Covers common problems encountered with residential cooling systems and how to correct them.

Book (SK22-01).....	020-107.....	15.00
†CD-ROM (SK22-02CD)	020-124.....	50.00

Troubleshooting Heat Pumps (Residential-Light Commercial)

Covers preliminary inspection, insufficient air, improper defrost, excessive electrical consumption, proper refrigerant charge and special components.

Book (SK24-01)	020-111	15.00
†CD-ROM (SK24-02CD)	020-129	50.00

Troubleshooting Furnaces

Covers common problems encountered with gas furnaces and how to correct them.

Book (SK23-01).....	020-109	15.00
CD-ROM (SK23-02CD)	020-128	50.00

Troubleshooting Rooftops

Helps technicians to troubleshoot rooftop units and to identify common problems. Use of a maintenance log and diagnostic trend chart is stressed to help technicians recognize abnormal operating conditions.

Book (SK27-01).....	020-125	15.00
†CD-ROM (SK27-02CD)	020-127	50.00

Troubleshooting (Semi-Hermetic) Compressors and Systems

Describes 3-step approach to determining interrelated compressor and system problems. Relates pressure, temperature and electrical readings to possible problems.

Book (SK25-01).....	020-113	15.00
†CD-ROM (SK25-02CD)	020-132	50.00

Troubleshooting Reciprocating Liquid Chillers

Presents typical chiller operation, operation checks, symptoms of common problems, troubleshooting examples and exercises. This advanced program assumes the student has an understanding of basic principles of chiller operation. It features a typical job visit and use of a maintenance log to compare design temperatures to actual system readings.

Book (SK26-01A)	020-115	15.00
Maintenance Log (Pad of 25) (SK26-03A)	020-117	7.50/pad
†CD-ROM (SK26-02CD)	020-133	50.00

Standard Service Techniques

Absorption Book

Leak Testing, Evacuation, Charging and Refrigerant Sampling.

(SM-16)	594-217	6.00
---------------	---------------	------

Air Properties and Measurement

Analyzes and defines the properties of air, illustrates use of a psychrometric chart, discusses air measurement procedures and instruments, reviews fan laws and airflow calculations to solve air side problems.

Book (SST-03A).....	020-253	9.00
†CD-ROM (SST-04APP).....	020-211	50.00

Centrifugal Compressor Book

Foundation Preparation, Installing, Alignment and Grouting.

(SM-15B)	594-218	3.00
----------------	---------------	------

Refrigerant Service Techniques

Covers: refrigerants, safety, minimizing contamination of systems, management and containment systems, charging tools and equipment, and service procedures used on centrifugal and reciprocating refrigeration equipment.

Book (SST-01).....	020-650	10.25
--------------------	---------------	-------



CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Computer-Based Training

HVAC Performance PLUS Simulator

Replace costly, old-fashioned mechanical trainers with this exciting, state-of-the-art interactive computer simulation of an air conditioning system. Configure the system the way you want it by changing the type of compressor or metering device, or the system tonnage. Change ambient conditions and system-operating parameters, then observe, record, and compare the effects on system temperatures, pressures, efficiencies, refrigerant states, and power consumption. System responses can be shown and printed using pressure/enthalpy (Ph) graphing and data tables. Contains a narrated introduction to the simulator itself, including program features, navigation, suggested uses, and additional training resources. Includes one student workbook containing exercises with suggested inputs to simulate system responses in certain conditions. An outstanding teaching aid for instructors and a valuable learning tool for students from entry-level to experienced technician. Also includes two FREE simulated interactive service calls, testing the student's ability to diagnose and correct mechanical and electrical circuit malfunctions. Additional Performance PLUS Troubleshooting CD's are available. (020-547).

This program is not compatible with Windows® 8 or higher.

Performance PLUS Simulator CD-ROM (GT65-03A)	020-546	350.00
Student Workbooks (GT65-01)	020-549	15.00



HVAC Performance PLUS Troubleshooting Practice

The HVAC Performance PLUS Troubleshooting Practice Series offers students the ability to refine their troubleshooting skills. CD contains practice sessions with a selection of 11 real-life service problems where students use a virtual toolbox to diagnose and correct mechanical refrigeration cycle, air system or electrical circuit malfunctions. Student progress is monitored and recorded as they progress through each troubleshooting scenario. Ideal for self-study or classroom instruction. **This program is not compatible with Windows® 8 or higher.**

Series 1 CD-ROM with Instructor Guide (GT69-01A)	020-547	50.00
--	---------	-------



†CD-ROM or USB contains a PowerPoint presentation which is editable and can be used for instructor-led instruction. Many contain a self-paced version with audio which can be used for individual instruction. Both versions will work with Windows 7 products but this version may not work on some Apple products. To get a version which can be used on learning management systems (LMS) contact www.carrieruniversity.com

Residential Split Systems Products

25VNA Infinity™ Variable Speed Heat Pump Unit

Training covers 25VNA high-efficiency heat pump with Greenspeed Intelligence. Covers familiarization, controls, operation, start-up, maintenance and troubleshooting.

Book (25VNA-01)	06-C20-665	11.50
†CD-ROM (25VNA-02CD)	06-C20-666	50.00



24VNA9 and 25VNA8 Infinity® Cooling and Heat Pump Outdoor Units

This service-training program covers Carrier's Infinity® 19VS air conditioner model 24VNA9 and Infinity® 18VS high-efficiency heat pump condensing unit model 25VNA8. These units feature variable-speed rotary compressors driven by a variable-speed drive. They can use either the Infinity® Touch communicating controls for full variable speed functionality, or a standard, 2-stage or single-stage thermostat, for limited functionality. The program covers familiarization, controls and hardware, start-up and configuration, service, maintenance, and troubleshooting.

Book (24/25VNA-01)	06-C24-028	11.50
--------------------------	------------------	-------

Residential Application Guide

This training covers the 24 series air conditioners and 25 series heat pumps, their nomenclature and features for each of their 4 tiers: Base, Comfort, Performance and Infinity, so that you can design and sell them. It is designed to teach you how to select the system type, component style and tier for each product used in Carrier cooling or heat pump split system. Component sizing is included, as well as long line design strategies and air system design guidelines.

Book (Appl-01)	06-C24-027	15.00
----------------------	------------------	-------

Furnaces

59MN,TN,TP,SP,SC Condensing Furnaces

This training covers Carrier's family of +90 AFUE induced combustion furnaces. Topics include: familiarization, installation, start-up and electrical operating sequences.

Book (59MN,TN,TP,SP,SC-01)	06-025-868	11.50
†CD-ROM (SK1-02CD)	06-025-869	50.00



CDs will be converted to USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Residential Control System

SYSTXCC Infinity® Touch Control

This training introduces Carrier's industry-leading new Infinity™; Touch User Interface (UI) residential control. Controls include a touch-screen User interface that replaces the previous push button Infinity™ User Interface.

Book (SYSTXCC-01A)	06-C20-683	15.00
†CD-ROM (SYSTXCC-02-CD)	06-C20-684	50.00

Rooftop Units

48/50HC,TC and 50TCQ Small Rooftop Units

Training covers the 48/50 HC high-efficiency family and 48/50 TC and 50TCQ standard-efficiency family of small rooftop products.

Book (48/50HC,TC-01)	06-C24-888	12.50
†CD-ROM (48/50HC,TC-02-CD)	06-C24-889	50.00

48/50 HC,HG,PD,PG,PM Rooftop Units ComfortLink Control Systems V5.0

This program covers the ComfortLink Control System Version 5.0 and explains how to use the scrolling marquee interface to start up, configure, and troubleshoot Carrier 48 and 50HC, HG, PD, PG and PM units. This program covers these rooftop products in sizes from 3 through 25 tons as cooling only and cooling with gas or electric heat. This program on the ComfortLink Control System Version 5.0 presents the necessary training for a technician to become familiar with the control system, access the control menus and configure the rooftop product, access and verify or input setpoints, understand the controls operation, perform the test routine and troubleshoot the unit with the controls.

Book (48/50PG/HC/HG-01)	06-024-890	11.50
CD-ROM PPT (48/50PG/HC/HG-01)	06-024-891	50.00



For product training information on older models please contact Carrier University
Phone: 800-644-5544 Option 2
Email: carrierubookstore@carrier.utc.com

Servicing Compressors

Compressors

Introduces basic compressor types, construction, function and capacity.

Book (GTAC-105)	022-009	7.75
†CD-ROM (GTAC1-5CD)	022-044	50.00

Be Compressor Wise

Conditions for compressor change, changeout procedure and system checkout procedure. Updated refrigerant-handling techniques.

Book (GTC19-101)	020-257	7.75
------------------------	---------------	------

Preventing Compressor Failures

Present the basics of Analyzing Compressor/Systems Problems.

Book (GTC4-101)	020-490	7.75
†CD-ROM (GTC-4PP).....	020-412	50.00

Why Compressors Fail II

This program includes troubleshooting tips, and an analysis section on semi-hermetic compressors.

Book (GTC2-101B) English Version	020-346	9.50
Book (GTC2-101S) Spanish Version	020-327	9.50
†CD-ROM (GTC-2BCD).....	020-348	50.00

Clean-Up After Burnout

Identify mild or severe burnouts and prevent repeat failures by using proper clean-up procedures. Updated refrigerant-handling techniques.

Book (GTC-18)	020-262	7.75
†CD-ROM (GTC-18CD).....	020-622	50.00

Scroll Compressors

Familiarization, Operation and Service of the most popular compressors used in residential and light commercial units.

Book (GTC10-101)	020-514	7.75
------------------------	---------------	------

Hermetic Compressor Replacement

First, learn how to determine if the compressor has failed; then, take a step-by-step process to a successful compressor replacement. Start-up and checkout of the system are included.

Book (SK16-01)	020-061	5.25
†CD-ROM (SK16-02CD)	020-627	50.00

Oil-Refrigerant Migration

Covers miscibility, rate of absorption and reducing oil dilution.

Book (GTA1-101).....	020-241	10.25
----------------------	---------------	-------

Troubleshooting (Semi-Hermetic) Compressors and Systems

Describes 3-step approach to determine interrelated compressor/system problems. Relates pressure, temperature, and electrical readings to possible problems.

Book (SK25-01).....	020-113	15.00
†CD-ROM (SK25-02CD)	020-132	50.00

Carlyle 5-Line Compressor

Describes Open Drive Teardown and Rebuild procedures.

Book (5F, H-01)	020-502	7.75
CD-ROM PowerPoint with Audio (5F, H-02CD)...	020-615	50.00

Carlyle 06D, 06E, 06CC Semi-Hermetic Compressors

This popular program includes safety and troubleshooting tips for all Carlyle semi-hermetic compressors.

Book (GTC3-101A)	020-338	7.75
CD-ROM PowerPoint with Audio (GTC-3ACD)....	020-340	50.00

Capacity Control Carlyle 5, 6 Line Compressors

Explains installation, operation and troubleshooting unloaders used in semi-hermetic compressors.

Book (GTC1-101A)	020-300	7.75	
CD-ROM PowerPoint Presentation with Audio (GTC-1ACD)	020-616	50.00

06D & 06E Compressor (Pocket) Service Guide

Handy reference includes model identification, service procedures, parts and electrical data.

Book (06D-01)	020-611	4.25
---------------------	---------------	------

Carlyle Semi-Hermetic Compressor Cutaways

Full-color compressor cutaways with callouts.

06D 8-1/2" x 11", 4 color (GTC-15).....	020-323.....	2.50 /ea
06E 8-1/2" x 11", 4 color (GTC-16)	020-324	2.50 /ea
06D & 06E Wall Charts 24" x 30" (GTC-17).....	020-325	11.00/set



CDs will be converted to USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com

Safety Training

Safety Guide for Refrigeration and Air Conditioning Equipment

Use to promote safety awareness for people who own, operate or maintain refrigeration and air conditioning equipment.

Book 571-100 4.00

Safety 2000

This program was produced by joint effort of Service Training and Carrier Corporation's EHS department and should be included in your safety training objectives. It is designed to promote safety awareness and provide a safer, healthier environment. It covers: personal protective equipment, material safety data sheets (MSDS), vehicle safety, emergency response, ergonomics, lifting and back safety, hazard communication, electrical safety, ladders, working at heights, fall protection, welding and brazing, compressed air and gas, refrigerants, leak testing, environmental practices, good housekeeping and confined space entry. Also safety practices needed to service: reciprocating, air handlers, cooling towers, absorption, and centrifugal equipment.

This program provides a basic understanding of good safety practices both on the job site or when using your service vehicle. You should know why safety is your concern, what hazards to watch out for and what safety precautions are required for each type of equipment.

Book (GT67-01)..... 020-602 9.00

†CD-ROM (GT67-03)..... 020-604 50.00

Indoor Air Quality

Indoor Air Quality Products and Fundamentals

Emphasizes the "Control, Filter, Refresh" approach to residential IAQ. It covers IAQ problems, product familiarization, equipment selection/application, operation and general maintenance. The 10-minute video compares various air filter media and equipment performance. A PowerPoint player is included on the CD training presentation along with an interactive ventilator search program.

Book 020-606 9.00

†CD-ROM (GT68-02)..... 020-607 50.00



CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Controls Skills

Understanding Wiring Diagrams

This program describes how to read and interpret wiring diagrams.

Book (SK13-01)..... 020-368 10.25

Understanding Electronic Controls I

Increases student's understanding of electronic controls and their use in HVAC systems.

Book (SK8-01A) 020-409 9.00

Understanding Electronic Controls II Microprocessor Controls

Provides an understanding of relationship of inputs and outputs in microprocessor controls used in HVAC systems.

Book (SK21-01)..... 020-102 9.00

Understanding Electronic Controls III Variable Speed Technology

This program provides an understanding of variable speed motors and their use in heating and cooling systems.

Book (SK27-01)..... 020-118 9.00



Remote Mounted Thermostats

Bi-Metal, Electronic (including no sub base) and Programmable. Discusses purpose and function, characteristics and operation, installation, service and troubleshooting.

CD ROM PPT with Audio (GTA-8CD) 020-240 50.00

Book (GTA8-101 B)..... 020-249 7.75

YAC "IGC" Integrated Gas Unit Controller

Provides information on the functions and operation of the Integrated Gas Unit Controller (IGC) board used for control of combustion and blower motor operation on gas-fired rooftop equipment. Covers familiarization, electrical operating sequence and an overview of diagnostic features.

Book (GT54-01A) 020-512 7.75



CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Technical Development Programs

TDPs provide you with technical training materials designed to help contractors, engineers, and designers to effectively design, specify, sell, and apply HVAC equipment in commercial applications. Each of these programs consists of a CD that contains a PowerPoint™ presentation with instructor notes that you can use to present a class, typically three hours per topic. The presentation contains animations where appropriate and hyperlinks to the various segments to assist you in hosting a professional training session. High-quality graphics and photos are used in all presentations, and video clips are used in some programs to demonstrate more complex topics. Other instructor features include a convenient link to charts and tables or other supplementary material.

Additionally, books are available to use in your sessions or to hand out for self-study. Each full-color book clearly covers the topic and enhances the learning experience through state-of-the-art graphics.

Introduction to HVAC TDP-101 Industry Overview

This TDP provides a general overview of the commercial HVAC industry, providing an awareness of: the design process; participants in the design and construction process; documents involved in construction; a typical timeline of activities in the design and construction process; and how these activities are influenced by the different participants in the process. This industry is also influenced by regulatory agencies and legal concerns that are important to designers of HVAC systems.

Book	06-796-025	18.00
PowerPoint CD	06-797-025	50.00

▲ **UPDATED** TDP -102 ABCs of Comfort



The Carrier TDP modules deal primarily with the design and operation of comfort air conditioning. To design these comfort air conditioning systems, it is first necessary to understand what comfort is, and how a system designer can influence the human perception of comfort. The “ABCs of Comfort” is a module of the introductory series and is intended to introduce system designers to the parameters that influence human comfort, and how the air system and mechanical refrigeration system

work together to control these conditions. The material presented helps the designers determine one of the first objectives of the system design, which is to establish the comfort standards for the project.

Book	796-026	18.00
USB.....	797-026	50.00

TDP -103 Concepts of Air Conditioning

This module deals with the functions an air-conditioning system must perform to provide comfort air conditioning. Elementary air-conditioning definitions are explained and the fundamental classification of systems is described. The types of systems, with their components and how they control multiple building zones, are discussed. It is intended for people new to the industry or who may not be familiar with the many types of HVAC systems available. At the end of this module, a novice should have a general understanding of air-conditioning systems and how they deal with building zoning considerations.

Book	796-027	18.00
PowerPoint CD	797-027	50.00

▲ **UPDATED**

Psychrometrics

TDP-201 Psychrometrics: Fundamentals

Psychrometrics is the study of the air and water vapor mixture. Proficiency in the use of the psychrometrics chart is an important tool for designers of air conditioning systems. Psychrometrics is required to properly calculate heating and cooling loads, select equipment, and design air distribution systems. While the topic is not complicated, it involves a number of formulas and their application; the psychrometric chart is useful in simplifying the calculations. This module is an introduction to air-vapor mixtures, the information obtained from the chart, and plotting the eight basic air conditioning processes.

Book	796-030	18.00
USB Drive.....	06-797-030	50.00

Load Estimating

TDP-300 Load Estimating Level 1: Overview

An overview of commercial load estimating provides individuals with an understanding of what a load estimate is and how it is used. Heat transfer methods and theory are used to explain building load components that provide the foundation for all load estimates. Solar radiant energy is presented, along with other climatic conditions, to explain external site-related conditions that affect building heat gains and losses.

Book	06-796-085	18.00
PowerPoint CD	06-797-085	50.00

TDP-301 Load Estimating Level 2: Fundamentals

The fundamentals of commercial load estimating are needed to understand the various load components that go into making a practical estimate of the amount of heating and/or cooling energy needed to condition a building. Done properly, a load estimate provides the data necessary to select heating and cooling equipment that can condition the occupied spaces within a building. In the earliest stages, the load estimate will tell the designer how big the job is, either in terms of cooling capacity, expressed as tons of refrigeration, or in terms of airflow cfm. If the characteristics of the loads for the building and the HVAC system are known, then an analysis of the application can be used to come up with the correct load and equipment selections to complete the design. Along with psychrometrics, load estimating establishes the foundation upon which HVAC system design and operation occur.

Book	796-034	18.00
PowerPoint CD	797-034	50.00

TDP-302 Load Estimating Level 3: Block and Zone Loads

The block and zone load portion of commercial load estimating takes the designer through the process of making a practical estimate of the amount of heating and/or cooling energy needed to condition a building. Block and zone load estimates provide the data necessary to select heating and cooling equipment that can condition the spaces within a building. Using the outputs for the building block and zone load estimates, the HVAC system equipment selections can be made to complete the design. Along with Psychrometrics, load estimating establishes the foundation upon which HVAC system design and operation occur.

Book	06-796-035	25.00
PowerPoint CD	06-797-035	50.00

Load Estimate Forms (Refer to TDP-301)

Forms to be used when calculating a heating load estimate or an air conditioning load estimate. Uses Carrier ETD factor method.

Heating (E10-A) Pad of 25	797-005	7.50/pad
Air Conditioning (E20-A) Pad of 25	797-006	7.50/pad

▲ UPDATED

Refrigeration Cycle

TDP-400 Principles of Mechanical Refrigeration Introduction

Air conditioning is all about moving heat energy, by either adding or removing it from one place and moving it to another. This module deals with the way heat is moved from a place of lower temperature to a place of higher temperature in a process called mechanical refrigeration. This process is used in preserving the food we eat and for comfort air conditioning. Much of the equipment discussed in other TDP modules dealing with equipment uses the principles discussed in this module. A designer needs a thorough understanding of the concepts of mechanical refrigeration to create the best performing and cost-effective projects. The Principles of Mechanical Refrigeration is divided into two books, Introduction and Analysis. Before proceeding to the equipment TDPs, the information in the Introductory material should be understood. The Analysis TDP will provide a better understanding of how to evaluate unit performance and select refrigeration components.

Book 796-037 18.00
 USB Drive..... 06-797-037 50.00

TDP-401 Principles of Mechanical Refrigeration Cycle Analysis

This second module on Mechanical Refrigeration develops the pressure enthalpy diagram and uses it to explain and analyze the mechanical refrigeration process. The pressure-enthalpy diagram is the tool used by designers of HVAC equipment to determine the size and performance of each system component. Most designers do not select each component, particularly since packaged-type equipment has become the norm; however, the pressure-enthalpy diagram gives the designer a very useful tool for understanding refrigeration system modifications or options and their impact on cycle performance. This TDP has five sections describing and developing the diagram.

Book 06-796-084 25.00
 PowerPoint CD 06-797-084 50.00

TDP404-Compressor Types

The compressor is one of the four basic components required for the mechanical refrigeration process. While most system designers will not normally select a compressor by itself, the compressor is one of the major components of the air-conditioning systems that they design. An understanding of compressors and how they operate will help the designer better select and apply air-conditioning units. This TDP has four major sections describing compressors and their operation and application. First, the different refrigeration cycles are discussed. These include the positive displacement cycle, the dynamic cycle (Centrifugal Cycle) and the absorption cycle. The second section explains terminology associated with compressors and compressor design and operational issues that relate to several of the types of compressor designs. The third section explains each of the five major compressor types used in comfort cooling applications in terms of the principle of operation, construction, and performance. The final section addresses system impacts on compressors and how compressors are selected to match the design requirements. A knowledge of the basics of the mechanical refrigeration cycle is necessary to understand this TDP.

Book 06-796-040 25.00
 PowerPoint CD 06-797-040 50.00

Distribution Systems

TDP-502 Water Piping and Pumps

Water piping and pumping is a foundation topic of HVAC design. The correct layout, selection, and sizing of the piping system and associated hydronic components is required to properly deliver chilled and hot water as required to maintain comfort conditions.

Book 796-043 18.00
 PowerPoint CD 797-043 50.00

TDP-504 Duct Design Level 1: Fundamentals

This module will look at the way commercial duct design creates an airflow conduit for interconnecting an air handler, VAV, and CV terminals, and room air distribution devices as a means of delivering conditioned air to the occupants of a building. A step-by-step design process will be presented covering such aspects of duct design as zoning, load determination, layout, sizing, and determining static pressure losses for system fan selection. After completing the module, participants will be able to manually size ductwork using either a friction chart or a duct calculator.

Book 796-045 18.00
 PowerPoint CD 797-045 50.00

Commercial HVAC Equipment

Air Handling Equipment

TDP-611 Central Station Air Handlers

Air handlers do not just handle air. They also cool, heat, filter, and humidify. Central station air handlers are typically “built to order” with a wide variety of available options and accessories to choose from. Central station air handlers are available factory designed for indoor use or for rooftop mounting. This TDP module will explain the types of equipment and the sectional components that comprise an air handler, both indoor and outdoor types, discuss the best applications served by central station air handling units and why, as well as the software programs used for selection.

Book 796-049 18.00
 PowerPoint CD 797-049 50.00

TDP-612 Fans: Features and Analysis

The heart of any air handling system is the fan. Fans consume more energy in a typical HVAC system than the compressors! It is extremely important that the correct type of fan be chosen for the application. This TDP module will describe fan characteristics and performance, in order to provide designers with the knowledge to select the proper fan for various HVAC applications.

Book 796-050 18.00
 PowerPoint CD 797-050 50.00

TDP-613 Fans in Variable Air Volume Systems

One of the reasons that VAV (Variable Air Volume) systems are popular is because they provide fan energy savings that constant volume systems cannot. As a general statement, fans consume more energy in a typical HVAC system than the compressors. Therefore, it is important that the correct type of VAV fan be used for the application. Equally important is that the fan in a VAV system is stable at part load operation, as well as full load operation. This TDP module will explain the types of fans that can be used in VAV systems, as well as the controls that may be applied to regulate each.

Book 796-051 18.00
 PowerPoint CD 797-051 50.00

TDP-614 Coils: DX, Chilled Water and Heating

There are many coil applications used in HVAC design. They range from small residential sizes to large built-up coil banks in custom air-handling units. Regardless of their size, all coils serve the important function of changing the temperature of the air to satisfy comfort or process requirements. There are two main categories of coils, heating or cooling. Heating coils use electricity, hot water, or refrigerant hot gas as a heating medium. Cooling coils use direct expansion (cold refrigerant) or chilled water. In this TDP, a design engineer will learn about the components, features, and applications for direct expansion and chilled-water cooling, and hot water, steam, and electric heating coils. With an understanding of these items, the design engineer can proceed with confidence to perform a proper coil selection and prepare a specification.

Book	06-796-052	18.00
PowerPoint CD	06-797-052	50.00

Chillers

TDP-622 Air-Cooled Chillers

Air-cooled chillers can be used as a single-piece unit or a split in various configurations. This flexibility has contributed to their overall popularity among designers of chilled-water systems. Air-cooled chillers range in size from small-capacity models to several hundred-ton models that are utilized to cool large commercial buildings. This TDP module will cover both packaged single-piece air-cooled chillers as well as split system types. This TDP module will also cover the available options and accessories for air-cooled chillers, as well as criteria for selecting an air-cooled chiller.

Book	796-054	18.00
PowerPoint CD	797-054	50.00

TDP-623 Water-Cooled Chillers

Water-cooled chillers range in size from small 20-ton capacity models that can fit in an elevator to several thousand-ton models that cool the world's largest facilities such as airports, shopping centers, skyscrapers, and other facilities. This TDP module will concentrate on the larger chillers in the range of 200 tons and upward. We will cover both screw and centrifugal-type compressor water-cooled chillers, as they tend to be the most popular designs for larger commercial applications. This TDP will also discuss the options and accessories available for water-cooled chillers and the criteria used when selecting a water-cooled chiller.

Book	796-055	18.00
PowerPoint CD	797-055	50.00

Packaged Units

TDP-631 Rooftop Units Level 1: Constant Volume

Smaller tonnage constant volume rooftop units are the most widely used units in the commercial air conditioning industry. They are produced by the tens of thousands by the major manufacturers and are applied to a wide cross section of installations, ranging from strip malls to schools and offices. Their key features and applications are the focus of the material in this TDP module.

Book	796-056	18.00
PowerPoint CD	797-056	50.00

TDP-632 Rooftop Units Level 2: VAV Rooftops

Large rooftop units are a fast-growing segment of the rooftop industry. A large VAV (variable air volume) rooftop unit with VAV terminals can be used in the place of multiple smaller constant volume units as a way of providing multiple zones of temperature control. With fewer rooftop units, duct systems, power supplies, and roof penetrations, cost savings are realized. The VAV rooftop unit can be incorporated with a variety of VAV terminals to form a complete system. Large VAV rooftop units are also being used in some applications traditionally reserved for applied equipment, such as central station air handlers and chiller systems. The rooftop variable air volume system offers a competitive first cost, competitive operating cost, ease of service, good indoor air quality capabilities, and good part-load humidity control. The ability to deliver these benefits has led to increased use of variable air volume systems using large tonnage rooftop units.

Book	06-796-057	18.00
PowerPoint CD	06-797-057	50.00

TDP-633 Indoor Self-Contained Units

Self-contained units are a unique segment of the packaged air conditioning industry. They are available in a variety of configurations for both air-cooled and water-cooled applications. For comfort air conditioning applications, they are popular for use as spot coolers in stores, restaurants, and industrial buildings. Self-contained units are often used in multiples, usually with a cooling tower, to form a floor-by-floor system in high-rise buildings. All sizes of self-contained units are available for constant volume (CV) applications. Smaller tonnage self-contained units can be used with zoning systems such as variable volume temperature (VVT[®]) systems where multiple control zones are required. Units above 20 tons in capacity are available factory-modified for variable air volume (VAV) applications where multiple zones of control are necessary and fan energy savings is desired.

Book	06-796-058	18.00
PowerPoint CD	06-797-058	50.00

TDP-634 Split Systems

Split systems are one of the major categories of HVAC equipment, and the primary system type used in residential air conditioning. Split systems are classified as a unitary, or packaged unit, and, as such, have many of the benefits of packaged equipment while offering the flexibility associated with applied products. This module will describe what split systems are, the components of the system and accessories frequently used. It will show the designer how systems are applied, explain common installation issues, and describe how to select a system.

Book	796-059	18.00
PowerPoint CD	797-059	50.00



CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Other Equipment

TDP-641 Cooling Towers and Condensers

Heat rejection is a process that is central to air conditioning. The heat is rejected to the environment using air or water as the medium. This TDP module discusses the most common heat rejection methods: condensers and cooling towers. In order to apply systems to a design, HVAC designers must be aware of the different heat rejection methods. In this TDP we discuss total heat of rejection, its derivation, and how it applies to the process of air conditioning, as well as the controls that may be used to regulate each.

Book	796-060	18.00
PowerPoint CD	797-060	50.00

Systems

TDP-701 System Selection

System selection can be a simpler, more understandable process if the designer and owner follow a step-by-step procedure. This TDP on System Selection presents one method that can be used by designers on most commercial projects. An example project will begin by assembling and documenting all available project data at the earlier phases of the design process. After determining the delivery method, budgets and schedules, and running rough heating and cooling loads for a zoned project, an initial list of potential HVAC systems will be assembled. This list will be reviewed against various design criteria that were determined for the project. The final two or three HVAC systems will be evaluated against a prioritized list of design criteria using a rating method called the Systems Scoresheet. The system with the highest numerical rating, once approved, will then be designed and built. Throughout the selection and design processes, job requirements and system parameters are documented on the Design Record form presented in the TDP.

Book	06-796-066	25.00
PowerPoint CD	06-797-066	50.00

TDP-702 Comfort Control Principles

Air-conditioning systems maintain the desired indoor comfort level, starting with space temperature. Other comfort parameters include maintaining acceptable room humidity, air motion, air quality, and air purity. The relative importance of each system function depends upon the specific project and application. Zoning is required to maximize the number of spaces that are successfully conditioned to the design criteria. There are many different types of HVAC systems, and many more elements that can be used to achieve the heating and cooling capacity, provide ventilation, maintain humidity, distribute the air within the spaces, etc. This module will discuss various temperature control strategies and HVAC systems that can be employed to maximize comfort provided to the building occupants.

Book	06-796-067	18.00
PowerPoint CD	06-797-067	50.00

TDP-704 Variable Volume and Temperature Systems

VVT is an economical, all-air zoned system that is ideal for many commercial jobs, especially at a time when there is so much design emphasis being placed on high-quality air treatment, outdoor air ventilation, and room air circulation. VVT systems are a popular solution for heating and cooling multiple zone applications in small to medium size buildings. VVT controls typically are supplied pre-packaged from the HVAC equipment supplier and are ready to install by the mechanical contractor. The objective of this module is to define VVT and describe how it achieves zone temperature control.

Book	796-069	18.00
PowerPoint CD	797-069	50.00

TDP-706 Water Source Heat Pumps

This module will provide an understanding of the components in water source heat pump systems, configuration options, system benefits, and many applications associated with the overall system. WSHP systems have become a very popular choice for use in commercial buildings where individual zones of control are required to maintain comfort conditions. Building types that exhibit a simultaneous cooling and heating load are ideal candidates. WSHP systems have other desirable characteristics like zoning capability, ease of design, and reliability so that buildings where little or no reclaim will take place are often still considered for using a WSHP system.

Book	06-796-071	25.00
PowerPoint CD	06-797-071	50.00

Commercial Controls

TDP-801 Controls Level 1: Fundamentals

The fundamentals of HVAC controls introduces the basic concepts of control and the vocabulary necessary to understand HVAC controls that are part of the design of HVAC systems. This TDP will take the basic elements and building blocks of HVAC controls and show how comfort control systems create the desired equipment responses for maintaining room environmental condition set points.

Book	796-074	18.00
PowerPoint CD	797-074	50.00

TDP-802 Controls Level 2: DDC Networking

The networking of HVAC DDC controls includes the basic concepts of controls interoperability and the benefits of tying HVAC control systems into the greater network of building system controls. This TDP includes a refresher of the elements and building blocks of HVAC controls and presents basic control strategies used to create the desired equipment responses for maintaining space environmental condition set points. This module will explain the workings of control system networks, present four key management methods available through DDC control networks, and show how to specify network configuration and functionality.

Book	06-796-075	18.00
PowerPoint CD	06-797-075	50.00



**CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com**

Commercial HVAC Applications TDP-901 Acoustics and Vibration

Acoustic considerations for project designs are often overlooked. When overlooked, these issues result in noise issues that can be more expensive than if acoustic design were considered in project development. This TDP introduces system designers to the principles of acoustics and includes suggestions on how to address acoustic issues early in design. An approach is also presented on how to address an existing project with noise issues. Understanding acoustic design principles will help designers select and apply equipment and design distribution systems that more cost-effectively meet the project's total environmental quality (TEQ) goals. This module has seven sections. The first explains acoustic terms and how to add and subtract sound levels. The second section discusses the methods used to establish an acoustic rating both indoors and outdoors, including how manufacturer sound data is generated. The next two sections describe how to determine the acoustic design goal and how to estimate the sound at the receiver using the source-path-receiver concept. Specific guidelines are provided on how to estimate the sound at the equipment to control noise. The next section discusses troubleshooting existing projects, followed by controlling vibration at the design stage. Finally, guidelines are provided for preparing acoustic specifications.

Book	06-796-076	25.00
PowerPoint CD	06-797-076	50.00

TDP-902 Indoor Air Quality

This module evaluates the importance of Indoor Air Quality (IAQ) to the occupants of a building. An HVAC system may contribute to the problem of poor IAQ or provide means to maintain proper IAQ. Recent changes incorporated in *ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality* will be highlighted.

Book	06-796-077	25.00
PowerPoint CD	06-797-077	50.00

TDP-903 Life Cycle Costing for HVAC Systems

Decisions about the type of HVAC system or decisions related to making HVAC system modifications are based on financial justification. The federal government, sustainable design projects and many other entities require that these decisions be based on the total life cycle costs rather than first cost alone. The commonly used life cycle costing methods help determine the total life cycle financial impact. This training module discusses the life cycle costing methods and how they are applied to HVAC-related decisions. Six sections describe the basic concepts behind the life cycle cost methods, a recommended procedure to follow, what data should be included, where to find the data and several techniques to be used in evaluating the data and making a decision. Also covered are payback and several other decision-making tools. This material can equally be applied to public or privately funded projects with certain guidelines. This module will explain these guidelines and demonstrate a life cycle costing software program.

Book	06-796-078	25.00
PowerPoint CD	06-797-078	50.00

TDP-909 Filtration

The methods and products available for removing contaminants from the air is the focus of this TDP module. Filtration is one part of a good IAQ strategy and is used to manage the indoor environment. Specifically, the types of mechanical and gas-phase filters used in comfort air-conditioning applications along with electronic air cleaners are covered. Upon completion of this module, the student should have an understanding of the types of filters available, their capabilities, and applications.

Book	06-796-063	18.00
PowerPoint CD	06-797-063	50.00

TDP-910 Energy Recovery

This TDP module deals with the methods and product types that are available for air-to-air recovery of energy in comfort air-conditioning applications. The recovered energy is transferred from the building exhaust airstream to the building ventilation airstream. This transfer can result in energy savings and potential downsizing of the HVAC equipment. Upon completion of this module, the student should have a specific understanding of the types of energy recovery technology, the best fit for each type, and how to identify recovery opportunities in comfort heating and cooling applications.

Book	06-796-064	25.00
PowerPoint CD	06-797-064	50.00

TDP Text Books

TDP Book I - Fundamentals

Book 1A Contains – Industry Overview, ABC's of Comfort, Concepts of Air Conditioning, Psychrometrics: Introduction, Load Estimating Level 1: Overview and Load Estimating Level 2: Fundamentals.

Book 1B Contains – Refrigeration Cycle: Introduction, Duct Design Level 1: Fundamentals, Water Piping and Pumps, System Selection and Controls Level 1: Fundamentals.

Book	06-796-104	175.00
------------	------------------	--------

TDP Book II – Packaged Systems

Book 1A Contains – Rooftop Units Level 1: Constant Volume, Rooftop Units Level 2: VAV Rooftops and Indoor Self-Contained Units.

Book 1B Contains – Split Systems, Variable Volume and Temperature and Water Source Heat Pumps.

Book II.....	06-796-105	150.00
--------------	------------------	--------

TDP Book III – Applied Systems

Book 1A Contains – Central Station Air Handlers, Fans: Features and Analysis, Fans in Variable Air Volume Systems and Coils: DX, Chilled Water and Heating.

Book 1B Contains – Air-Cooled Chillers, Water-Cooled Chillers and Cooling Towers and Condensers.

Book III.....	06-796-106	150.00
---------------	------------------	--------

TDP Book IV – HVAC Advanced Topics

Book 1A Contains – Load Estimating Level 3: Block and Zone Loads, Filtration and Energy Recovery.

Book 1B Contains – Refrigeration Cycle: Cycle Analysis and Compressor Types.

Book 2A Contains – Comfort Control Principles, Controls Level 2: DC Networking and Acoustics and Vibration.

Book 2B Contains – Indoor Air Quality and Life Cycle Costing for HVAC Systems.

Book IV (2 book sets).....	06-796-107	175.00
----------------------------	------------------	--------



Air Conditioning System Design Guidelines

Text discusses factors influencing the selection of systems. Covers building loads and the relationship to zoning and system selection. The various systems discussed are: All-Air Systems, All-Water Systems, Air-Water Systems and Direct Refrigerant Systems. Heating System performance and Economizer Cycles are also presented. (20 pages)

Book 796-010 9.25

Air-to-Air Heat Pumps

This training module has been designed to equip the reader with the basic principles of the heat pump. The text explains the concept, operation, energy advantages, selection, control and application of air-to-air heat pumps. Although the basis of the text is the air-to-air heat pump, many of the principles covered are universally applicable to other types of heat pumps.

T200-85 Text (52 pages) 791-085 5.50
 T200-85PP PowerPoint Presentation 793-085 25.00

Air Cooling Coils

This training will review nomenclature, physical construction features, heat transfer characteristics, airside performance and design techniques related to air cooling coils. Both chilled water and direct expansion coil types are included. Primary emphasis is placed on comfort air conditioning application.

T200-22B Text (52 pages) 791-122 5.50
 T200-22PP PowerPoint Presentation 793-122 25.00

Introduction to Variable Air Volume

This presentation of material covers the general application guidelines for variable air volume systems. The material covered includes background, space loads, apparatus loads, system arrangements, system components and advantages. This presentation is particularly valuable to the better understanding of variable air volume (VAV) systems by architects, consultants, contractors and owners.

T200-45 Text (28 pages) 791-045 5.50
 T200-45PP PowerPoint Presentation 792-045 25.00

Load Estimating Using Storage Load Factors and Equivalent Temperatures (SDM Part 1 User Guide)

This program is aimed at developing the understanding and skills necessary to accomplish a "block" cooling and heating load estimate. The Carrier E-20 method is explained in 16 chapters of text with appropriate Work Sessions. The text illustrates calculations for an example building while the student performs similar calculations for another structure. The information presented is necessary to have full understanding of the output of computerized load estimates.

T200-90 Text (104 pages) 791-090 5.50

Refrigerant Piping Systems

Covers the layout, sizing, materials, accessories, safety and limit controls and design practices for single and multiple refrigerant piping systems. Discusses oil circulation and refrigerant migration and their effect on design.

T200-34B Text (84 pages) 791-234 5.50
 T200-34B PP PowerPoint Presentation 793-234 25.00

Refrigerant Piping for Split Systems

Presents the basics to understanding the procedures and use of data for designing and sizing refrigerant lines as applied to packaged equipment split systems. Also discussed are some of the problems involved in piping systems, thus aiding the designer in avoiding the compounding of design errors.

T200-64 Text (44 pages) 791-064 5.50

Refrigeration Cycle Accessories

This text contains a detailed discussion of commonly used accessory components used in air conditioning systems. Thermostatic expansion valve operation, types, and selection are explained. Also covered is the function and application of many other accessories such as solenoid valves, filter driers, mufflers, and accumulators. Part load controls such as hot gas bypass systems are also examined.

T200-12 Text (76 pages) 791-012 5.50

Room Air Distribution

Principles of room air distribution including blow, drop, induction and spread are explained. The text presents factors relative to the performance, rating and selection of sidewall, under-window and ceiling diffusers.

T200-24B Text (72 pages) 791-224 5.50
 T200-24B PP PowerPoint Presentation 793-224 25.00

Fundamentals of Psychrometrics

This training module presents the theory of psychrometrics and the derivation of the formula used to create the psychrometric chart. Once the fundamental concepts behind the psychrometric chart are understood the text uses examples to demonstrate the use of psychrometrics to solve typical air conditioning processes.

T200-20A Text (84 pages) 791-120 7.00



CDs will be converted to
 USB drives during 2018.
 Check website for media type.
www.CarrierUniversity.com

Residential Design Guides

Residential Air System Design

Discusses the various types of residential distribution systems and when they should be applied. Also describes extended plenum & reducing extended plenum (equal friction) system design procedure for sizing supply and return ducts and outlets using pre-engineered sizing charts. Demonstration and work session problems are included to illustrate procedures and insure understanding.

TDP-36 Text (94 pages) 791-443 8.50

Residential Cooling/Heating Load Estimating—REZ1

This program starts with a discussion of residential system design and the importance of accurate load estimates. This is followed by a review of the load-estimating procedure using the REZ-1 Block Load and Room-by-Room forms. A demonstration cooling and heating problem is used to illustrate how these easy-to-use forms produce results comparable to longer, nationally recognized load estimate methods. Two additional work sessions are provided for practice and better understanding.

TDP-6 Text (104 pages)..... 791-413 8.50

Residential Equipment Selection

This series covers selection of various types of residential equipment —cooling, heating, heat pump, and air treatment products. Typical rating data and selection procedures are presented and their uses are illustrated by means of a demonstration selection example. Also included in text is student work session selection and quizzes for each type of product.

TDP-16-1 Cooling Equip. Selection Text (68 pages)
..... 791-423 8.50

TDP-16-2 Heating Equip. Selection Text (52 pages)
..... 791-424 8.50

TDP-16-3 Heat Pump Selection Text (100 pages)
..... 791-425 8.50

TDP-16-4 Air Treatment Products Text (52 pages)
..... 791-426 8.50



Residential System Design Guide

The 11 chapters of this guide provide a professional, everyday approach for sizing and selecting cooling and heating equipment and for planning a quality system addition, modification, or complete installation. Focused on add-on replacement situations, it can be used as a ready-reference source for self-study or as the platform for an add-on/replacement training seminar.

CHAPTERS INCLUDE:

1. Introduction to Residential System Design
 2. Survey and Preliminary Air System Evaluation
 3. Load Estimating
 4. Cooling Equipment
 5. Heating Equipment
 6. Heat Pumps
 7. The Air System
 8. Supporting Systems
 9. Air Treatment Equipment
 10. Zoned Systems
 11. Glossaries, Tables, Guidelines, Worksheets, Forms
- Residential System Design Guide 791-451 100.00

Residential Application Guide

To familiarize you with the 24 series air conditioners and 25 series heat pumps, their nomenclature and features for each of their 4 tiers: Base, Comfort, Performance and Infinity, so that you can design and sell them. It is designed to teach you how to select the system type, component style and tier for each product used in Carrier cooling or heat pump split systems. Component sizing is included, as well as long line design strategies and air system design guidelines.

Book (Appl-01)..... 06-C24-027 15.00



CDs will be converted to
USB drives during 2018.
Check website for media type.
www.CarrierUniversity.com.

Carrier System Design Manual

The Carrier System Design Manual is the first practical guide for the design of air conditioning systems. This easy-to-use reference is designed specifically for the design and consulting engineer. It covers every step in the design process, from load estimating to selecting and engineering the appropriate system.

Although published in the 1960's, this manual is still a useful instructional guide to system design. However, it should be used in conjunction with current ASHRAE or other industry data. The complete System Design Manual consists of twelve (12) individual books. Bound manual consists of the 12 books (3 volumes in each set) listed below.

System Design Manual 590-367 125.00

Individual books may also be ordered separately as indicated below:

Part 1 - Load Estimating

A guide in the preparation of practical cooling and heating load estimates. Eight chapters include: survey and load estimate, design conditions, heat storage, solar heat gain glass, heat and moisture flow, infiltration and ventilation, internal and system heat gain, applied psychrometrics. (164 pages)

Part 1 510-304 15.00

Part 2 - Air Distribution

Includes data and examples as a guide in practical design and layout of air handling equipment, ductwork and air distribution components. (94 pages)

Part 2 510-308 13.50

Part 3 - Piping Design

Covers practical design and layout, including data and examples of normal air conditioning piping systems - piping design, water piping, refrigerant piping, steam piping. (110 pages)

Part 3 510-312 13.50

Part 4 - Refrigerants, Brines, Oils

A presentation guide in the application and selection of refrigerants, brines and oils when used with air conditioning systems. (68 pages)

Part 4 510-310 10.00

Part 5 - Water Conditioning

A background guide to a better understanding of the cause, effect and prevention of water problems in various water circulatory systems. Also discusses some of the more common practices for lessening the effect of scale and corrosion. (56 pages)

Part 5 510-318 10.00

Part 6 - Air Handling Equipment

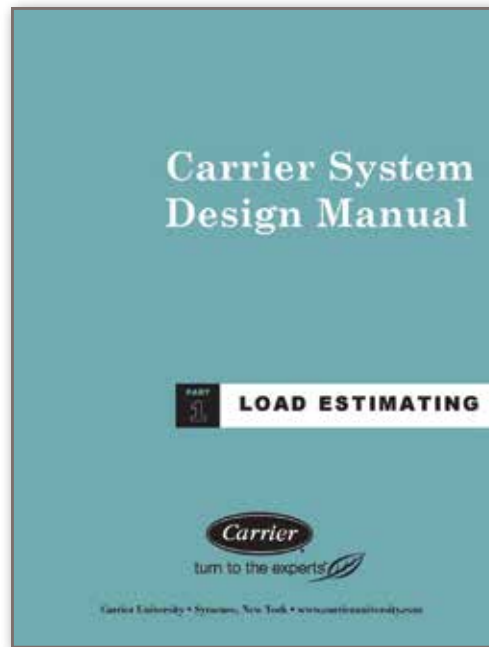
A discussion in the selection and application of air handling equipment for normal air conditioning systems - fans, air conditioning apparatus, unitary and accessory equipment. (72 pages)

Part 6 510-320 10.00

Part 7 - Refrigeration Equipment

Covers the selection and application of refrigeration equipment for normal air conditioning systems: reciprocating centrifugal, absorption, absorption-centrifugal combination refrigeration machines; heat rejection equipment. (72 pages)

Part 7 510-324 10.00



Part 8 - Auxiliary Equipment

Book is comprised of practical data for the selection and application of auxiliary equipment used with air conditioning systems—centrifugal pumps, motors and motor controls, boilers, miscellaneous drives. (76 pages)

Part 8 510-332 10.00

Part 9 - Systems and Applications

A guideline for selecting the air conditioning system used with specific applications. (24 pages)

Part 9 510-321 9.00

Part 10 - All-Air Systems

A presentation of data and engineering procedures to guide the engineer in the practical designing of all-air systems. The complete range covers the conventional, constant volume induction, multizone, dual-duct, variable volume and dual conduit systems. (60 pages)

Part 10 510-322 9.00

Part 11 - Air-Water Systems

A guide to the engineer in the practical designing of air-water systems for use in perimeter rooms of multistory; in multiroom buildings where cooling or heating may be required simultaneously in adjacent rooms; where ductwork space is at a minimum. (36 pages)

Part 11 510-327 9.00

Part 12 - Water and DX Systems

A guide, which includes data and engineering procedures, in the practical designing of water and DX systems. (22 pages)

Part 12 510-329 9.00

Process Refrigeration

This Book contains seven sections on the following subjects:

1. Process Refrigeration Cycles – Describes industrial process centrifugal refrigeration cycles to explain the advantages and disadvantages of various systems. Uses refrigerant 134A in three example comparisons.
2. Refrigerants – Deals with the properties, selection factors and application of refrigerants including 134A.
3. Heat Transfer Fluids – Discusses those fluids usually referred to as “brine”– meaning any secondary liquid coolant other than water. It discusses the properties, selection factors and application of such fluids to process refrigeration systems.
4. Centrifugal System Components – Describes components normally used in a process refrigeration system that is designed around centrifugal refrigeration equipment.
5. Centrifugal Compressor Components – General discussion of the components that make up industrial refrigeration centrifugal compressors. It delves into describing the parts of a centrifugal compressor and their functions.
6. Reciprocating Systems Components - Brief description of reciprocating compressors and their application in process refrigeration systems. It describes the major and minor components of reciprocating refrigeration systems.
7. Helical Screw Compressor System Components – Provides a brief description of screw compressors and their application. Reviews the components of screw compressor refrigeration systems.

ES-01 795-100 45.00



Engineering Guides

These guides provide the design engineer with various short cuts and time-saving procedures while still producing a dependable system design for a specific market application.

Altitude Effects

This guide provides reference data regarding the effects of altitude on air conditioning equipment. It is written to meet the specific needs of those responsible for the details of design or equipment selection (16 pages).

Guide 592-016 6.00

Comfort Design Made Simple

The number of variations and special features of comfort commercial systems is so vast that no two systems are exactly alike. However, there is a common method of design that works for all systems. In this guide, a straightforward, step-by-step design approach is presented and demonstrated for all-air, all-water, air-water and direct refrigerant systems. Commonality of design techniques for all systems is emphasized in the hope of bringing the process down from a complex task to very manageable endeavor. (36 pages)

ENG-01 795-200 8.00

Indoor Air Quality (IAQ)

This guide is directed to consulting engineers, design-build contractors, servicing and maintenance contractors, who have a working understanding of comfort air conditioning design, maintenance and codes regulating today's indoor air quality issues. The purpose of this engineering guide is to highlight areas of concern which have resulted from heightening focus on the quality of indoor air. Specific problems and solutions are presented with priorities noted and practical examples given.

ENG-02 (Approx. 36 pages) 795-201 8.00

Reciprocating Chiller Heat Reclaim System

This guide discusses the concept of heat reclaim, including system design, equipment selection criteria, controls and analysis of operating costs. (64 pages)

Guide 592-026 6.00



Commercial Systems Quick Reference (CSQR)

The Commercial Systems Quick Reference (CSQR) is a highly visual desk reference which illustrates the integration of numerous systems with a few representative buildings. Each building is realistic and not merely conceptual. In addition to systems applied in the buildings, the CSQR also contains spreadsheets on ten commonly used systems, a generic product feature run-down, and ballpark design guidelines. If you are new to or have some experience in designing or servicing HVAC systems, it provides a quick and easy way to put the myriad of systems and products in our business into simple categories. It also reminds you of some of the basic layout considerations and tradeoffs inherent to various systems. (Approx. 200 pages)

ENG-05 795-205 45.00

Water Source Heat Pump Design Guide

A practical step-by-step guide on how to design commercial water source heat pump systems. This design guide discusses product types, design considerations, a description of the complete design process, and an operating cost analysis for an example building in various climates. (Approx. 86 pages)

ENG-03 795-202 12.50

VAV Rooftop System Design Guide

Use this engineering design guide as an assist in putting together the equipment, terminals, diffusers, ductwork and controls needed to create a cost-effective HVAC system that can be just right for many of today's buildings. The guide is divided into two parts. Part one provides in-depth information about relevant design issues, and part two is a step-by-step approach to design. This manual will be appreciated by sales engineers, junior designers and experienced professionals alike. An example building is followed throughout the book. (Approx. 130 pages)

ENG-07 795-207 12.50

Cooling Check Figures and Design Air Distribution Rates

These figures will help you get a ballpark idea of the occupancy, lighting, ventilation and cooling requirements of a building during the schematic phase of the project.

Pad of 10 794-031 9.00/10

Small Rooftop VAV System Design Guide: New Construction

This design guide provides a step by step approach to designing a Variable Air Volume system using Carrier's 48 and 50 LC VAV rooftop units, VAV terminals and i-Vu control system. This guide covers the design process from initial load estimate, through selection of diffusers, VAV terminal and rooftop unit, to the control system selection and operation. This guide applies to any building where the entire HVAC system will be new.

ENG-08 795-208 18.00

Engineering Forms

REZ-1 Cooling/Heating Load Estimate (Packet)

Package containing: Data table booklet with completed examples; four block and four room-by-room load estimating forms.

Packet 794-104 14.00

Extra Estimate Forms: REZ-1 Block Load

(4 pages). Folds to 8-1/2 x 11.

Form 794-103 9.00/25

Rez-1 Room-By-Room Load

(4 pages). Folds to 8-1/2 x 11.

Form 794-102 9.00/25

REZ-1 Residential Heating & Cooling Survey & Checklist

Pad of 25 Survey & Checklist forms is backed up with a floor plan grid.

Form 794-107 7.00/pad

Residential System Design Guidelines

A four-page booklet containing the most used tabular data required for evaluating, applying and sizing components of residential air systems.

Booklet 794-111 2.00 each

Residential System Design Worksheet

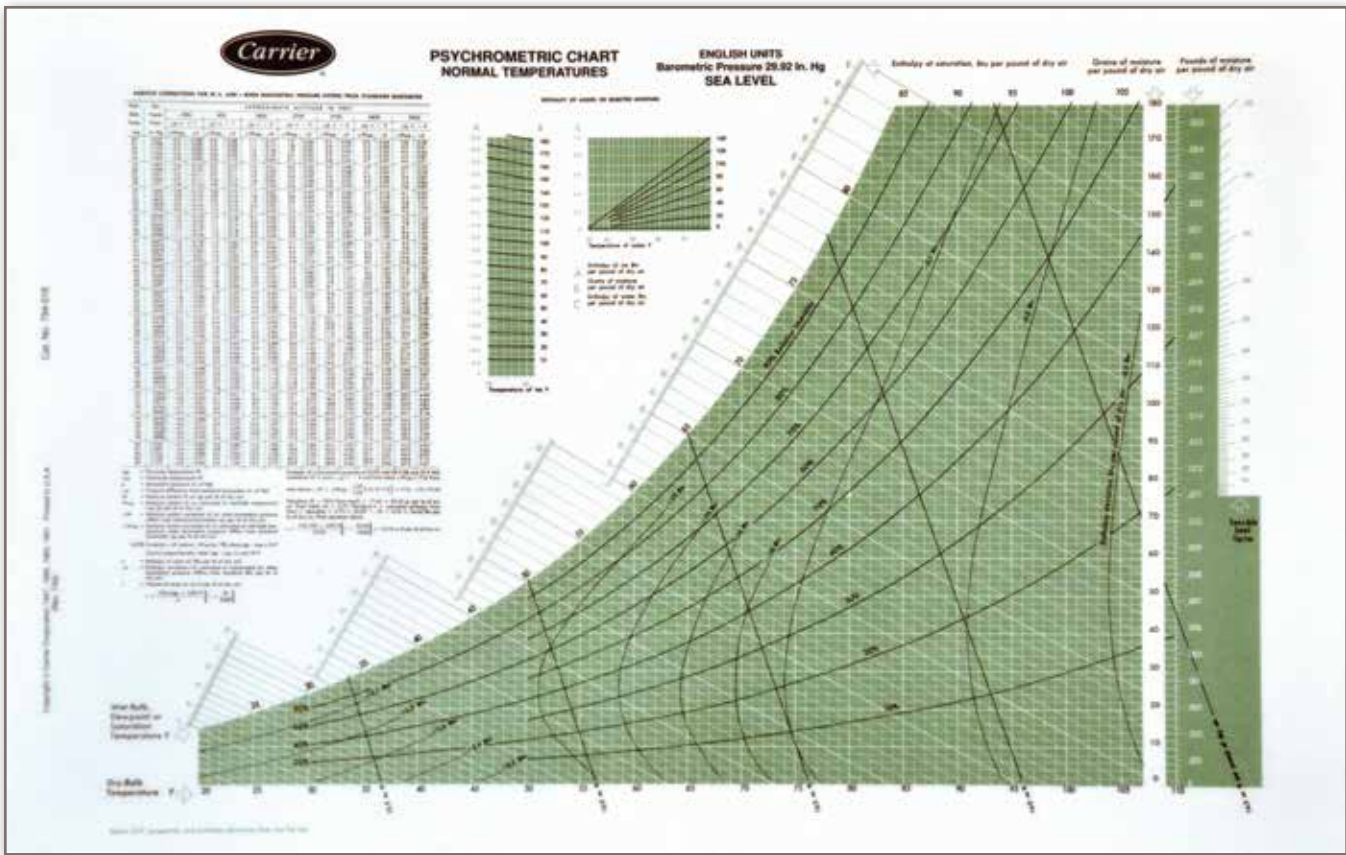
For recording design information – pre-engineered design and sizing data. (Reference TDP-36).

Pad of 25 794-110 5.00/pad

Residential Air System Evaluation Form

This form is the perfect guide for the service technician or residential sales person to evaluate the condition of the ductwork and air system in replacement situations.

Package of 10 794-113 3.00 pack



Engineering Charts

English Version (Fahrenheit/Foot/Pounds) Specifications

CATALOG NO.	TEMPERATURE	ELEVATION	FORMAT	SIZE	PRICE
794-015	Normal 20° to 110° F (Includes definitions, symbols, how-to-use, and examples)		2 Color 6 pages	Folds to 8.5 X 11 6 pages	16.00/25
794-018	Normal 20° to 110° F Low 20° to 50° F	Sea Level	Vinyl	2 sides 11 X 17	8.75 each
794-017	Normal 20° to 110° F	Sea Level	2 Color Paper	8.5 X 11	7.50/Pad
794-023	Normal 20° to 110° F	Sea Level	Laminated	24 X 37 Wall Chart	12.50 each
06-794-021 Contains 5 each of the following Charts:	Normal Temperatures	Sea Level		11 X 17	12.00 per set
	Normal Temperatures	2,500 Feet			
	Normal Temperatures	5,000 Feet			
	Normal Temperatures	7,500 Feet			
	Normal Temperatures	10,000 Feet			
	Low Temperature	Sea Level			
	High Temperature	Sea Level			

Engineering Charts

Metric Version (Centigrade/Meters/Grams) Specifications

CATALOG NO.	TEMPERATURE	ELEVATION	FORMAT	SIZE	PRICE
794-003	Normal 10° to 55° C Low -30° to 15° C	Sea Level	Vinyl	2 sides 11 X 17	8.75each
06-794-022 Contains 5 each of the following Charts:	Normal Temperatures	Sea Level		11 X 17	12.00 per set
	Normal Temperatures	Sea Level		8.5 X 11	
	Low Temperatures	Sea Level		11 X 17	
	High Temperature	Sea Level			
	Normal Temperatures	750 Meters			
	Normal Temperatures	1500 Meters			
	Normal Temperatures	2250 Meters			
	Normal Temperatures	3000 Meters			

Engineering Software

PSYCH+

Psych+ is a Windows-based computerized psychrometric chart and instructional guide that is applicable for all types of users, from the student to the professional engineer. The Psych+ electronic chart offers a convenient and accurate method for obtaining the properties of air-vapor mixtures, as well as the ability to effectively illustrate and solve a variety of air conditioning processes and/or cycles. With Psych+'s state-of-the-art technology and online help file, you can graphically portray system responses for easy interpretation of system data at computer speed. Psych+ is an instructional and engineering tool for today's design-conscious environment. **This program is not compatible with Windows® 8.**

Software PSYC-01A 794-120 75.00
 Student Book PSYC-02..... 794-121 5.50

Professional Development

Six Steps to Great Training

Using worksheets and examples, this manual guides trainers through a six-step process that assures effective training every time. Aimed at the part-time or casual technical trainer, this manual can also be used by anyone who is called upon to provide training.

Book 020-720 10.25

Award Certificates

Sale of these items is restricted to Distributors and Carrier offices only. Achievement certificates to be presented to student completing a course. Award certificates are 8.5 x 11 on parchment-type paper with gold foil border, laser-compatible. Signature line provided for instructor and distributor.

GTG-2 Certificate of Achievement..... 020-384 15.00/25

Tools, Rules, Pocket Cards, Etc.

Duct Calculator Static Regain

Convenient simplified method of sizing duct by static regain, equal friction and volume reduction. The handy calculator is a multicolor easy-to-read device. It is intended to be used by all duct system designers. Includes an 8-page book that describes the use of the duct calculator.

Calculator 599-922 18.80

Equal Friction Duct Calculator

A simple duct calculator, pocket size, for sizing air distribution systems by the equal friction method. Instructions and design data are imprinted on calculator.

T200-11..... 794-036 4.00 ea.

▲ UPDATED

HVAC Reference Pocket Chart

A pocket-size reference guide that an architect, engineer or contractor might find useful. Includes a psychrometric chart, important formulae and some handy charts relative to air conditioning. Enclosed in flexible plastic, it is durable enough to be around for a long time. Approximately 4.25 X 8 folds to 2.5 X 4.25

Guide 794-014 7.50/10.

SHF Alignment Ruler

A unique device that simplifies plotting of the sensible heat factor line and determination of apparatus dewpoint on the psychrometric chart. Also serves as an architectural scale. Clear plastic ruler, 11-1/4 x 1-1/2, is packaged in envelope with instructions. Includes three holes for insertion in ring binder.

T200-83 798-013..... 3.75

Natural Gas Furnace Manifold Pressure Calculator

Uses slide rule calculator to determine Gas Furnace Manifold Pressure in residential furnace applications.

Calculator (GT26-01A)..... 020-444 4.75

Superheat/Subcooling Charging Calculator/Slide Rule

For use with HCFC-22 systems(GT24-01)..... 020-434 4.00

For use with R-410A systems (GT58-01)..... 020-517 4.00

Puron® Subcooling Calculator

Puron® R-410A on one side and R-22 on the other. Also includes TXV troubleshooting tips.

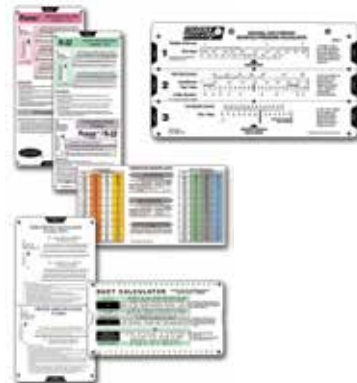
Calculator 06-020-640 4.00

Pocket Service Card (Residential)

For Field Superheat/Subcooling Charging. Also contains Temperature-Pressure Charts for HCFC and HFC refrigerants. (Package of 10.)

For HCFC-22 Systems (GT51-01) 020-499 7.00/10

For HFC-134A Systems (GT52-01)..... 020-500 7.00/10



Reciprocating Liquid Chiller Maintenance Log

A pad of 25 blank log sheets to record operating pressures on reciprocating liquid chillers. Includes a trend chart for identifying different system problems. (See [Troubleshooting Reciprocating Liquid Chiller Training, Skills section.](#))

Maintenance Log Sheets (Pad of 25) (SK26-03A)

..... 020-117 7.50/pad

Absorption Machine Equilibrium Diagram with PIC

This is an important tool for troubleshooting both single- and double-effect absorption machines equipped with Product Integrated Controls (PIC). Universal charts based on the McNeeley equations are used to plot absorption machine cycles, to find absorber loss, and help diagnose problems. Its extended range allows plotting of all double-effect absorption machines.

Pad of 25 charts (GT63-01) 020-501 6.00

Laminated Chart (GT63-02)..... 020-516 7.25

Applies to All Orders

- Designate shipping. Be sure to include street address—we cannot deliver to a PO Box.
- Prices and offerings are subject to change without notice.
- Where items are padded or packaged in quantities of 10 or 25, the minimum order is one pad or package. We cannot split packages to fill an order.
- Ground freight is prepaid and allowed. Shipped by Federal Express.

Fax form to 860-660-6087
or email to: carrierubookstore@carrier.utc.com
or mail to:
Carrier University
PO Box 4808 / TC-1
Syracuse, New York 13221-4808

Carrier Offices and Distributors — Domestic & International

Purchase using Carrier Corporation standard ordering procedures – SAP (distributors) or email (Carrier offices)
GPCARInHouseOrders@carrier.utc.com

International Customers — Non-Carrier Companies

We regret that international orders cannot be accepted.
Please contact your local Carrier office or distributor.

Canada Orders — Non-Carrier Companies

We regret that international orders cannot be accepted.
Please contact your local Carrier office or distributor.

For Credit Card Orders

Please complete Literature Order Form with all necessary information and return to Carrier University to obtain your order number and total dollar amount. You will be provided a link to our secure site to enter your credit card information.

Your order will be shipped upon credit card approval. If you are tax exempt, please provide your tax-exempt certificate.

Discounts

- Volume Discounts – A 10% discount is applied to orders that total \$1,500.00 and up.
- We will calculate discounts when placing orders. Fill in order form using prices found on website.
- List quantity, catalog number, description, price and extended price for each item.
- Sales tax will be added to your order, unless you are tax exempt. If you are tax exempt, please provide a tax-exempt certificate.

Phone: 800-644-5544 Option 2

Fax: 860-660-6087

Email: carrierubookstore@carrier.utc.com

Carrier University Literature Order Form



For Credit Card Orders:

Please complete this form with all necessary information and return to Carrier University to obtain your order number and total dollar amount. You will be provided a link to our secure site to enter your credit card information. Your order will be shipped upon credit card approval.

Fax this form to **860-660-6087** or
 email to: carrierubookstore@carrier.utc.com
 or mail to: **Carrier University**
Bynum Training Center
PO Box 4808
Syracuse, New York 13221-4808

Ship To Address:

Company Name:

Attn:

Street: CANNOT SHIP TO PO BOXES

City/State/ZIP:

Phone:

Email:

PO Number:

Special Instructions:

Item	Quantity Ordered	Catalog No.	Description	Unit Price	Extended Price
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Shipping	Ground Freight is prepaid and allowed.	Minimum Order Amount \$10.00	Subtotal	
			Sales Tax	
If you are tax exempt, please enclose a tax-exempt certificate.			Total	



Carrier University

Bynum Training Center

PO Box 4808

Syracuse, NY 13221-4808

1-800-644-5544

1-860-660-6087 fax

carrieruniversity@carrier.utc.com

**CARRIER
UNIVERSITY**

Experts never stop learning.



CarrierUniversity.com