



TRANE[®]



Federal Supply Service

U.S. General Services Administration

Authorized Federal Supply Schedule Price List

On-line access to contract ordering information, terms and conditions, up-to-date pricing, and the option to create an electronic delivery order are available through GSAAAdvantage!®, a menu-driven database system. The INTERNET address GSA Advantage!® is: GSAAAdvantage.gov.

Schedule Title:

MAS – Multiple Award Schedule

FSC Group:

B – Facilities

G – Miscellaneous

J - Security and Protection

PSC Codes:

N099 – Installation of Miscellaneous Equipment

6350 – Miscellaneous Alarm, Signal, Security Detection Systems

Contract Number:

47QSWA20D002A

Contract Period:

12/10/2019 to 12/9/2024

Contractor Info:

TRANE U.S. INC.

3600 PAMMEL CREEK RD

LA CROSSE, WI 54601-7511

651-407-4216

www.trane.com

GSASchedule@Trane.com

Business Size:

Large



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This Schedule Contract Price List includes Modifications through No. **PS-0006, effective October 16, 2020.**

INFORMATION FOR ORDERING OFFICES
1a. Awarded Special Item Numbers:

SIN	Description
334512.....	Total Solutions Support for Facility Management Systems
334290.....	Security and Detection Systems
238910.....	Installation and Site Preparation Services
OLM.....	Order Level Materials
561210FAC.....	Complete Facilities Maintenance and Management
541690E.....	Energy Consulting Services
ANCRA.....	Ancillary Repair and Alteration
ANCILLARY.....	Ancillary Supplies and Services

1b. Lowest Price Model Number and Lowest Unit Price for the Special Item Number Awarded in the Contract – See Pricing.
1c. Hourly Rates – See Pricing.
2. Maximum Order:

SIN 334512.....	\$250,000 per order.
SIN 334290.....	\$250,000 per order.
SIN 238910.....	\$250,000 per order.
SIN OLM.....	\$250,000 per order.
SIN 561210FAC..	\$1,000,000 per order.
SIN 541690E.....	\$1,000,000 per order.
SIN ANCRA	\$250,000 per order
SIN ANCILLARY ..	\$250,000 per order.

Pursuant to FAR 8.405-1, The Maximum Order established in Schedule contracts is the threshold at which it is advantageous for an ordering office to seek further concessions from a Contractor. The Contractor may accept an order of any amount, including one exceeding the maximum order threshold. For an order in an amount above the maximum order threshold for the specific SIN in the contract, a Government purchaser should seek further concessions from the Contractor. When presented with such a request, the Contractor may grant additional concessions, offer the product at the existing contract price, or refuse the order.

3. Minimum Order:

\$100.00 per order.

4. Geographic Coverage (delivery area):

The scope of the contract is the 48 contiguous states, Alaska, Hawaii, Puerto Rico, Washington, D.C., and U.S. Territories.

5. Points of Production (city, county, and state or foreign country):

Name of Manufacturer	Production Point
Trane U.S. Inc.	3600 Pammel Creek Road LaCrosse LaCrosse County Wisconsin 54601-7599 Phone: 608-787-2000 Phone (Marketing):608-787-3907 Fax: 608-787-2204 www.trane.com
Trane U.S. Inc.	4833 White Bear Parkway St. Paul Ramsey County Minnesota 55110 Phone: 1-800-877-1327 Fax: 651-407-4197 E-mail: GSASchedule@trane.com www.trane.com
Trane U.S. Inc.	CDS 3600 Pammel Creek Road LaCrosse LaCrosse County Wisconsin 54601-7511 Phone: 608-787-3926 Fax: 608-787-3005 E-mail: cdshelp@trane.com www.trane.com
Trane U.S. Inc.	101 William White Boulevard Pueblo Pueblo County Colorado 81001-4800 Phone: 1-888-244-5537 Fax: 719-585-3896 www.trane.com
Trane U.S. Inc.	2701 Wilma Rudolph Blvd. Clarksville Montgomery County Tennessee 37040-5846



Phone: 931-648-5945
Fax: 931-648-5901
www.trane.com

Trane U.S. Inc. 182 Colton Belt Parkway
McGregor
McLennan County
Texas 76657-3411
Phone: 254-299-6300
Fax: 254-299-6671
www.trane.com

Trane U.S. Inc. Inland Marketing Services
3030 Airport Road
La Crosse
La Crosse County
Wisconsin 54603-1251
Phone: 608-787-3926
Fax: 608-783-4705
www.trane.com

Trane U.S. Inc. 4500 Morris Field Drive
Charlotte
Mecklenberg County
North Carolina 28208
Phone: 800-755-5115
Fax: 704-398-4681
www.trane.com

Trane U.S. Inc. 1515 Mercer Road
Lexington
Lexington-Fayette County
Kentucky 40511
Phone: 800-228-1666
Fax: 859-288-2618
www.trane.com

Trane U.S. Inc. 7610 Industrial Highway
Macon
Bibb County
Georgia 31216
Phone: 478-781-6495
Fax: 478-784-4239
www.trane.com

Trane U.S. Inc. Lynn Haven Unit
200 Aberdeen Loop
Panama City
Bay County
Florida 32405
Phone: 850-271-6030
Fax: 850-271-6040
www.trane.com

Trane U.S. Inc. 141 Commons Pkwy
Columbia
Lexington County
South Carolina 29203

Phone: 1-877-788-7263
www.trane.com

Trane U.S. Inc. 9900 Aire Circle
Fort Smith
Arkansas 72916
Phone: 479-648-7400
Fax: 479-648-7499
www.trane.com

Trane U.S. Inc. Grand Rapids
5005 Corporate Exchange Blvd SE
Grand Rapids
Michigan 49512
Phone: 844-801-6048
www.trane.com

Trane U.S. Inc. Rushville
1300 N. Benjamin St.
Rushville
Indiana 46173
Phone: 765-932-7200
www.trane.com

6. Discounts from Commercial List Prices:

GSA Net Prices are shown on the attached GSA Price List. Negotiated discount has been deducted and the IFF has been included.

7. Quantity Discounts:

To be determined at the Task Order Level.

8. Prompt Payment Terms:

Prompt payment is ½% 10 days Net 30 days from date of invoice or date of acceptance, whichever is later. Credit card transactions are excluded.

Information for Ordering Offices: Prompt Payment Terms cannot be negotiated out of the contractual agreement in exchange for other concessions."

9a. Government Commercial Credit Card:

Government purchase cards are accepted.

9b. Government Commercial Credit Card:

Government purchase cards are accepted above the micro-purchase threshold.

10. Foreign Items (list items by country of origin):

None

11a. Time of Delivery:

As negotiated at the Task Order Level.

11b. Expedited Delivery:

As negotiated at the Task Order Level.

11c. Overnight and 2-Day Delivery:

As negotiated at the Task Order Level.

11d. Urgent Requirements:

As negotiated at the Task Order Level.

12. FOB Point:

Shipment shall be F.O.B. Destination with title passing to the Government upon delivery by the carrier, freight allowed and prepaid. The contractor shall be responsible for all expenses connected with the return of defective products or parts. The Government shall be responsible for expenses connected with all other returns. A restocking fee of 15% of the purchase price shall be charged to the Government for the return of non-defective products or parts.

13a. Ordering Address:

See "Trane Sales Offices" section for listing of ordering addresses.

13b. Ordering Procedures:

For supplies and services, the ordering procedures, information on Blanket Purchase Agreements (BPA's) are found in Federal Acquisition Regulation (FAR) 8.405-3.

14. Payment Address:

Payment may be made to:

Trane U.S. Inc.
4833 White Bear Parkway
St. Paul, MN 55110

or to Trane U.S. Inc. in care of one of the Participating Dealers listed in the "Trane Sales Offices" section.

Trane may direct a purchasing office to forward payment to one of the following "remit to" addresses, which will be listed on the invoice:

Trane U.S. Inc.
P.O. Box 406469
Atlanta, GA 30384-6469

Trane U.S. Inc.
P. O. Box 98167
Chicago, IL 60693

Trane U.S. Inc.

P. O. Box 845053
Dallas, TX 75284-5053

Trane U.S. Inc.
File 56718
Los Angeles, CA 90074-6718

Schedule customers seeking to make EFT payments should access CCR (Trane Cage Code 60532, DUNS No. 12-636-5795) or contact Trane Accounts Receivables Department at (608) 787-2629.

15. Warranty Provisions:

Standard Commercial Warranty applies. Contact the contractor for a copy of the warranty.

16. Export Packing Charges:

Point of Exportation for all other overseas locations. In place of a delivery/installation date for equipment, a shipping date shall be specified on the order. The Contractor shall pay for shipment to a CONUS APO/FPO. At the option of the Government, F.O.B. will be Point of Origin, with freight prepaid and invoiced. Authorization for all shipping, export, and other charges must be included on the Government order.

17. Terms and Conditions of Government Purchase Card Acceptance (any thresholds above the micropurchase level):

No special concessions granted.

18. Terms and Conditions of Rental, Maintenance, or Repair:

For locations in the 48 contiguous states, Alaska, Hawaii, Puerto Rico, and Washington, D.C., maintenance and repair is performed by the sales offices listed in the attached list of Trane Sales Offices in the United States, based on terms and prices set at each sales office. Contact each sales office for maintenance and repair available.

19. Terms and Conditions of Installation:

Installation for locations in the 48 contiguous states, Alaska, Hawaii, Puerto Rico, and Washington, D.C. is performed by the sales offices listed in the attached list of Trane Sales Offices in the United States, based on terms and prices set by each sales office.

20. Terms and Conditions of Repair Parts:

Repair parts are stocked and sold by the sales offices listed under the section "Trane Sales Offices."

20a. Terms and Conditions for any other services.

None.

21. **List of Service and Distribution Points:**

See Attached List of Trane Sales Offices.

22. **List of Participating Dealers:**

See Attached List of Trane Sales Offices.

23. **Preventive Maintenance:**

Preventive Maintenance is performed by the sales offices shown on attached list of Trane Sales Offices.

24a. **Environmental Attributes (e.g., recycled content, energy efficiency, and/or reduced pollutants):**

The right HVAC system is critical to green building and there are many HVAC strategies to help address energy, indoor environmental quality and water elements that in turn, can help earn LEED credits. Trane, as a leading global supplier of HVAC systems, services and solutions, helps achieve green building goals. Here are just some of the ways that Trane offering is helping buildings go green and attain LEED certification.

Designing and Engineering Your Green

Building - TRACE™ 700 is the complete design tool for load, system, energy and economic analysis, and is used to earn LEED EAc1 points. TRACE 700 complies with Appendix G for Performance Rating Method of ASHRAE Standard 90.1-2007 for LEED analysis, and was the first simulation software approved by the IRS for energy-savings certification (EPAcT). TRACE is also tested in compliance with ANSI/ASHRAE Standard 140-2007.

Constructing Your Green Building -

EarthWise™ Systems use state-of-the-art Trane products, systems and controls to optimize performance. This includes the ability to balance installed cost and operating cost while improving comfort, indoor air quality, and acoustics. EarthWise Systems provide high efficiency/low emissions performance that can be documented over the entire lifetime of the building.

EarthWise™ CenTraVac Chillers are rated by the U.S. Environmental Protection Agency as best-in-class energy-efficient designs and **FEMP** designation. CenTraVac Chillers are also a three time Climate Protection Award winner as the most energy-efficient, lowest-emission large chillers available and are the only chillers in the world to

earn Environmental Product Declaration (EPD) registration following the requirements of ISO 14025.

Voyager™, Precedent™ and Intellipak™ commercial rooftop air conditioner units and **Odyssey™** split system performance meets or exceeds ASHRAE 90.1 standard. This standard sets acceptable energy efficiency performance requirements and is used by the DOE for both NAECA and EPAcT. Some product lines have 2 or 3 tiers of efficiency levels available to choose from and some **Voyager™** Model TC* and YC* are **Energy Star**.

Trane Axiom™ water-source heat pumps (WSHP) deliver high-performance heating and cooling with exceptional efficiency: up to 40 EER on select systems. Within Trane's WSHP line, units are offered for the application of Geothermal and other WSHP systems that help your buildings work better and is a highly efficient technology that uses the ground as a heat source in winter and as a heat sink in summer. Technology is considered as a Renewable Energy.

Operating and Controlling Your Green

Building - Tracer™ controls provide advanced control of complex systems to achieve energy savings and measure performance. Trane 2,000 factory-authorized service professionals, over 300 LEED AP Certified, and over 145 Certified Energy Managers contribute to efficient and sustainable building operations.

Products are identified with environmentally sustainable products symbols in Trane Price List (Catalog or GSA Advantage) as appropriate. Trane currently has products with the following sustainable products symbol designations.



24b. **Section 508 Compliance:**

Not Applicable

25. **Data Universal Number System (DUNS) number:**

DUNS No. 12-636-5795

26. **Notification Regarding Registration in System for Award Management (SAM):**

Contractor is registered. Cage Code is 60532.



TRANE SALES OFFICES

TRANE COMPANY-OWNED
LOCAL SALES OFFICE

Albany, NY – Central New York

(518) 785-1315
FAX: (518) 785-4359 - Sales
301 Old Niskayuna Road
Latham, New York 12110-2214

Albuquerque, NM

(505) 884-2044
FAX: (505) 884-2449
5501 San Diego Avenue NE
Albuquerque, New Mexico 87113

Allentown, PA

(484) 223-1730
FAX: (484) 2231-1824
5925 Tilghman Street, Suite 70
Allentown, PA 18104

Anchorage, AK

(907) 267-7400
FAX: (907) 267-7481
12101 Industry Way, Bldg C1
Anchorage, AK 99515

Appleton, WI

(920) 734-4531
FAX: (920) 734-2044
2500 N. Lynndale Drive
Appleton, Wisconsin 54914

Asheville, NC

(828) 277-8664
FAX: (828) 277-5848
1400 Sweeten Creek Road
Asheville, NC 28803

Atlanta, GA

(404) 321-7500
FAX: (404) 636-5204
4000 Dekalb Technology Pkwy, Suite 100
Atlanta, Georgia 30340

Augusta, GA

(706) 738-8157
FAX: (706) 733-7842
3342 Commerce Drive
Augusta, GA 30909

Austin, TX

(512) 416-8822
FAX: (512) 416-8894
9801 Metric Blvd., Suite 400
Austin, TX 78758

Baltimore, MD

(410) 403-2200
FAX: (410) 403-2225
10947 Golden West Drive, Suite 100
Hunt Valley, Maryland 21031

Baton Rouge, LA

(225) 298-4280
FAX: (225) 291-9472
11534 Cloverland Avenue
Baton Rouge, LA 70879-8158

Birmingham, AL

(205) 7474-4000
FAX: (205) 747-4006
1030 London Drive, Suite 100
Birmingham, Alabama 35211

Boise, ID

(208) 362-0916
FAX: (208) 362-7463
351 N. Mitchell St., Suite 100
Boise, ID 83704

Boston, MA

(781) 938-9700
FAX: (781) 938-8912
181 Ballardvale Street
Wilmington, Massachusetts 01887

Burlington, VT

(802) 864-3816
FAX: (802) 864-5093
175 Leroy Road
Williston, VT 05495

Cape Girardeau, MO

(573) 334-0591
FAX: (573) 334-0680
1078 Wolverine Lane #D
Cape Girardeau, MO 63701

Charleston, SC

(843) 375-4775
FAX: (843) 375-4776
2011 Clements Ferry Road
Charleston, SC 29492

Charlotte, NC

(704) 525-9600
FAX: (704) 525-8582
4501 South Tryon Street
P.O. Box 240605 (28224)
Charlotte, North Carolina 28217

Chattanooga, TN

(423) 296-1506
FAX: (423) 485-8139
6138 Preservation Drive, Suite 500
Chattanooga, TN 37416

Chicago, IL

(630) 734-3200
FAX: (630) 323-9040
7100 South Madison
Willowbrook, Illinois 60527-5505

Cincinnati, OH

(513) 771-8884
FAX: (513) 772-7281
10300 Springfield Pike
Cincinnati, Ohio 45215

Colorado Springs, CO

(719) 599-3900
FAX: (719) 268-0200
4242 N. Nevada Avenue
Colorado Springs, CO 80907

Columbia, SC

(803) 936-4700
FAX: (803) 936-4715
111 Lott Court
West Columbia, South Carolina 29169

Columbus, OH

(614) 473-3500
FAX: (614) 473-3501
2300 City Gate Drive, Suite 100
Columbus, Ohio 43219-3652

Dallas, TX (TSO)

(972) 406-6000
FAX: (972) 243-1398
P.O. Box 814609
Dallas, Texas 75381-4609
1400 Valwood Parkway, Suite 100
Carrollton, Texas 75006

Davenport, IA

(563) 468-4900
FAX: (563) 391-0277
4801 Grand Ave.
Davenport, Iowa 52807

Denver, CO

(303) 228-3300
FAX: (303) 228-2828
445 Bryant St., Unit 5
Denver, Colorado 80204

Detroit, MI

(248) 596-3600
FAX: (248) 596-3636
37001 Industrial Road
Livonia, Michigan 48150

El Paso, TX

(915) 593-3484
FAX: (915) 593-3490
1405 Vanderbilt Drive
El Paso, TX 79935

Fargo, ND

(701) 235-0521
FAX: (701) 293-3136
300 45th Street SW
Fargo, North Dakota 58103

Fort Collins, CO

(970) 490-1052
FAX: (970) 490-1191
2416 Donnella Court, Unit D
Fort Collins, CO 80524

Fort Wayne, IN

(260) 489-0884
FAX: (260) 489-5117
6602 Innovation Blvd.
Fort Wayne, IN 46818

Fort Worth, TX

(817) 838-1300
FAX: (817) 831-8135
4200 N. Sylvania Avenue
Fort Worth, TX 76137

Fresno, CA

(559) 271-4625
FAX: (559) 271-4630
5599 N. Golden State Blvd.
Fresno, California 93722

Grand Junction, CO

(970) 242-4438
FAX: (970) 248-3959
2387 River Road, Unit 110
Grand Junction, CO 81505

Grand Rapids, MI

(616) 971-1400
FAX: (616) 971-1401
5005 Corporate Exchange Blvd. S.E.
Grand Rapids, Michigan 49512

Greenville, SC

(864) 672-6000
FAX: 864-672-6001
288 Fairforest Way
Greenville, South Carolina 29607

Harrisburg, PA

(717) 561-5400
FAX: (717) 561-5499
3909 TecPort Drive
Harrisburg, Pennsylvania 17111

Hartford, CT

(860) 616-6600
FAX: (860) 616-6599
716 Brook Street, Suite 130
Rocky Hill, CT 06067

Honolulu, HI (TSO)

(808) 845-6662
FAX: (808) 845-2168
2969 Mapunapuna Pl, Ste 101
Honolulu, Hawaii 96819

Huntsville, AL

(256) 837-1030
FAX: (256) 837-2058
4825 Commercial Drive
Huntsville, AL 35816

Indianapolis, IN

(317) 255-8777
FAX: (317) 251-8556
5355 North Post Road
Indianapolis, Indiana 46216

Jacksonville, FL

(904) 363-6088
FAX: (904) 363-1134
8929 Western Way, Suite 1
Jacksonville, Florida 32256

Johnson City, TN

(423) 224-1150
FAX: (423) 224-1151
10384 Wallace Alley Street
Kingsport, Tennessee 37663

Johnstown, PA

(814) 266-3020
FAX: (814) 266-3015
1255 Scalp Ave.
Johnstown, Pennsylvania 15904

Kansas City, MO

(913) 599-4664
FAX: (913) 599-4669
8014 Flint
Lenexa, Kansas 66214

Knoxville, TN

(865) 588-0607
FAX: (865) 588-0600
5220 S. Middlebrook Pk.
Knoxville, TN 37921

La Crosse, WI

(608) 788-8430
FAX: (608) 787-0454
2525 Larson Street
La Crosse, WI 54603

Lincoln, NE

(402) 438-9220
FAX: (402) 438-9221
7800 O Street, Suite 101
Lincoln, NE 68540

Long Island, NY

(718) 269-3600
FAX: (718) 269-3758
245 Newtown Rd, Suite 500
Plainview, NY 11803

Los Angeles, CA

(626) 913-7123
FAX: (626) 913-7153
17760 Rowland Street
City of Industry, California 91748

Lubbock, TX

(806) 747-0266
FAX: (806) 744-1033
717 E 40th Street (79404)
PO Box 3963
Lubbock, TX 79452

Macon, GA

(478) 743-5429
FAX: (478) 743-2731
125 Macon West Drive
Macon, GA 31210

Madison, WI

(608) 838-8200
FAX: (608) 838-6015
4801 Voges Road, Suite A
Madison, Wisconsin 53718

Manchester, NH

(603) 263-2060
FAX: (603) 263-2062
47 Constitution Drive
Bedford, New Hampshire 03110

Memphis, TN

(901) 345-6000
FAX: (901) 345-2803
1775 Pyramid Place, Suite 100
Memphis, Tennessee 38132

Miami, FL (

(305) 592-0672
(954) 499-6900
FAX: (954) 499-6901
2884 Corporate Way
Miramar, Florida 33025

Milwaukee, WI

(414) 266-5200
FAX: (414) 266-5216
234 W. Florida Street
Milwaukee, WI 53204

Mobile, AL

(251) 665-2999
FAX: (251) 665-2920
4932 Tufts Road
Mobile, Alabama 36619

Montgomery, AL

(334) 215-2900
FAX: (334) 215-2901
915 Lagoon Business Loop
Montgomery, AL 36117

Nashville, TN

(615) 242-0311
FAX: (615) 726-3357
601 Grassmere Park Drive, Suite 10
Nashville, Tennessee 37211

New Orleans, LA

(504) 733-6789
FAX: (504) 731-0833
530 Elmwood Park Blvd.
Harahan, Louisiana 70123

New York, NY

(718) 269-3600
FAX: (718) 269-3601
45-18 Court Square
Long Island City, New York 11101-4347

North Jersey, NJ

(973) 887-8800



FAX: (973) 887-8844
4 Wood Hollow Road
Parsippany, New Jersey 07054-0436

Oklahoma, OK

(405) 787-2237
FAX: (405) 787-0752
305 Hudiburg Circle
Oklahoma City, Oklahoma 73108

Omaha, NE

(402) 331-7111
FAX: (402) 331-5200
5720 S. 77th Street
Ralston, Nebraska 68127-4202

Orlando, FL

(407) 660-1111
FAX: (407) 660-0303
2301 Lucien Way, Suite 430
Maitland, FL 32751

Pensacola, FL

(850) 473-3840
FAX: (850) 505-9915
580 East Burgess Road
Pensacola, FL 32504

Phoenix, AZ

(602) 258-9600
FAX: (602) 253-3801
850 West Southern Ave
Tempe, Arizona 85282

Pittsburgh, PA

(412) 747-3000
FAX: (412) 747-4550
400 Business Center Dr.
Pittsburgh, Pennsylvania 15205

Portland, ME

(207) 828-1777
FAX: (207) 828-1511
860 Spring St. Unit 1
Westbrook, Maine 04092

Providence, RI

(401) 434-3145
FAX: (401) 434-8537
50 Vision Blvd.
East Providence, Rhode Island 02914

Rapid City, SD

(605) 342-7929
FAX: (605) 342-7930
6807 Sturgis Road
Black Hawk, SD 57718

Reno, NV

(775) 856-3343
FAX: (775) 856-1704
5595 Equity Avenue, Suite 100
Reno, Nevada 89502

Richmond, VA

(804) 747-3588
FAX: (804) 273-0119

10408 Lakeridge Parkway, Suite 100
Ashland, Virginia 23005

Roanoke, VA

(540) 563-2828
FAX: (540) 366-4958
2303 Trane Drive
Roanoke, Virginia 24017

Rochester, NY – Central New York

(585) 256-2500
FAX: (585) 256-0067
75 Town Centre Drive, Suite 300
Rochester, New York 14623

Sacramento, CA

(916) 577-1100
FAX (916) 577-1175
4145 Delmar Road
Rocklin, California 95677

Salt Lake City, UT (CSO)

(801) 972-3352
FAX: (801) 972-3353
2817 South 1030 West
Salt Lake City, Utah 84119

San Antonio, TX

(210) 657-0901
FAX: (210) 657-1761
9535 Ball Street, Suite 1100
P.O. Box 34597 (78265)
San Antonio, Texas 78217

San Diego, CA

(858) 576-2500
FAX: (858) 576-2554
3565 Corporate Court
San Diego, California 92123

San Juan, PR

(787) 798-0999
PR #1, Km. 25.1,
Banco Quebrada Arenas
San Juan, Puerto Rico 00926-1900

Savannah, GA

(912) 965-0313
FAX: (912) 965-0314
3609 Ogeechee Blvd., Suite A
Savannah, GA 31405

Seattle, WA

(425) 643-4310
FAX: (425) 643-4314
2333 158th Court NE
Bellevue, Washington 98008

Sioux Falls, SD

(605) 336-8500
FAX: (605) 336-0824
3500 South First Avenue, Suite 150
Sioux Falls, SD 57105

South Bend, IN

(574) 288-4914
FAX: (574) 282-4874
2301 Bendix Drive, Suite 400

South Bend, Indiana 46628

Springfield, MA

(413) 746-3090
FAX: (413) 746-0537
90 Carando Drive
Springfield, MA 01104

Springfield, MO

(417) 863-2110
FAX: (417) 863-2111
540 N. Cedarbrook
Springfield, MO 65802-6324

St. Louis, MO

(636) 305-3600
FAX: (636) 349-0601
101 Matrix Commons Drive
Fenton, Missouri 63026

Syracuse, NY – Central New York

(315) 234-1500
FAX: (315) 433-9120
15 Technology Place
East Syracuse, New York 13057

Tallahassee, FL

(850) 574-1726
FAX: (850) 575-5880
109 Hamilton Park Drive, Suite 1
Tallahassee, FL 32304

Tucson, AZ

(520) 748-1234
FAX: (520) 748-1492
4520 S. Coach Drive
Tucson, AZ 85714

Tulsa, OK

(918) 250-5522
FAX: (918) 250-5419
2201 N. Willow Avenue
Broken Arrow, OK 74012

Toledo, OH - CO

(419) 491-2280
FAX: (419) 491-2279
1001 Hamilton Drive
Holland, Ohio 43528

West Palm Beach, FL

(561-) 683-1521
FAX: (561) 697-8714
6965 Vista Parkway North #11
West Palm Beach, FL 33411

Westchester, NY

(914) 593-0303
12 Skyline Drive
Hawthorne, NY 10532

Wilkes Barre, PA

(570) 654-086510 Freeport Road
Pittston, Pennsylvania 18640-9514

Wichita, KS

(316) 265-9655
FAX: (316) 265-1974
120 Ida St.
P.O. Box 595 (67201)
Wichita, Kansas 67211

**TRANE INDEPENDENTLY-OWNED
LOCAL SERVICE OFFICES****Billings, MT**

(406) 248-4882
FAX: (406) 248-5196
3311 4th Avenue North, Suite 4
Billings, MT 59104

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(716) 626-1260
FAX: (716) 626-9412
45 Earhart Drive, Suite 103
Buffalo, New York 14221

Charleston, WV

(304) 346-0549
FAX: (304) 346-8920
540 Leon Sullivan Way (25301)
P.O. Box 627
Charleston, West Virginia 25322

Cleveland, OH

(440) 248-3400
FAX: (440) 349-6980
31200 Bainbridge Road
P.O. Box 76129
Solon, Ohio 44139

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815 Falls Creek Drive
Vandalia, OH 45377

Des Moines, IA

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FAX: (515) 270-3835
2220 NW 108th Street
Clive, Iowa 50325

Evansville, IN

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FAX: (812) 421-8735
1024 East Sycamore Street
Evansville, IN 47714

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(810) 767-7800
FAX: (810) 767-9058
5335 Hill 23 Drive
Flint, Michigan 48507

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(239) 275-9420
FAX: (239) 275-9775
6461 Topaz Court, Suite 1
Fort Myers, FL 33966

Great Falls, MT

(406) 727-5111

FAX: (406) 761-5173
422 9th Street S. (59405)
P.O. Box 2642
Great Falls, Montana 59403

Greensboro, NC

(336) 378-0670
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1915 N. Church Street
P.O. Box 13587 (27415-3587)
Greensboro, North Carolina 27405

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FAX: (713) 266-7011
10555 Westpark Drive
Houston, Texas 77042

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(601) 956-9211
FAX: (601) 957-9340
746 S. Ridgewood Road
P.O. Box 1557 (39158)
Ridgeland, Mississippi 39157

Lansing, MI

(517) 337-6517
FAX: (517) 337-9493
3350 Pine Tree Road
Lansing, MI 48911

Las Vegas, NV

(702) 876-7530
FAX: (702) 876-5106
3036 S. Valley View Blvd.
Las Vegas, Nevada 89102

Lexington, KY

(859) 514-7000
FAX: (859) 514-7870
2350 Fortune Drive
Lexington, KY 40509-4125

Little Rock, AR

(501) 661-0621
FAX: (501) 661-9109
1501 Westpark, Suite 9
Little Rock, Arkansas 72204-2457

Louisville, KY

(502) 499-7000
FAX: (502) 499-7870
12700 Plantside Drive
Louisville, Kentucky 40299-6387

Norfolk, VA

(757) 558-0200
FAX: (757) 558-9715
1100 Cavalier Blvd.
P.O. Box 6276
Chesapeake, Virginia 23323

Oakland, CA

(510) 433-8940

FAX: (510) 433-8954
383 4th Street, #202
Oakland, CA 94607

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Peoria, Illinois 61615-1681

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3606 Horizon Drive
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Portland, OR

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Mailing Address:
P.O. Box 23579
Tigard, Oregon 97281
Office Location:
7257 SW Kable Lane
Portland, Oregon 97224

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Morrisville, NC 27560

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310 Soquel Way
Sunnyvale, California 94085-4101

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(707) 542-4213
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987 Airway Court, Suite 18
Santa Rosa, CA 95403

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715 N. Hogan St.
P.O. Box 3304
Spokane, Washington 99220

Tampa, FL

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FAX: (813) 877-8257
902 Himes Avenue (33609)
P.O. Box 18547 (33679)
Tampa, Florida



Wilmington, DE

(302) 395-0200
FAX: (302) 395-0700

66 Southgate Blvd.
New Castle, Delaware 19720

Wilmington, NC

(910) 792-0339

FAX: (910) 792-0466
6736 Netherlands Drive, Suite A
Wilmington, NC 28405

END OF TRANE SALES OFFICES



Rotary Liquid Chillers & Scroll Liquid Chillers

Water-Cooled Series R Rotary Liquid Chillers, Air-Cooled Series R Rotary Liquid Chillers, Water-Cooled and Condenser less Scroll Liquid Chillers, and Water-Cooled and Condenser less Series R Rotary Liquid Chillers

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	 RTHD	Water-Cooled Series R® Rotary Liquid Chillers (175-450 Tons) - Utilize a single compressor/single circuit design with R-134a refrigerant. This model uses the CH530 control panel.	153	See Note 1 Below	
334512	 CGAM	Air-Cooled Scroll Liquid Chillers (20-130 Tons) Uses HFC-410A refrigerant	664	See Note 1 Below	
334512	 RTAC	Air Cooled Series R® Rotary Liquid Chillers (130-500 Tons)	154	See Note 1 Below	
334512	 RTWD	Water-Cooled Series R Rotary Liquid Chillers (60-250 tons)	703	See Note 1 Below	
334512	 RTAE	Stealth™ Helical Rotary Chiller (Model RTAE, 150-300 tons)	895	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.





CenTraVac™ Water-Cooled Centrifugal Liquid Chillers

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	CVHE 	CenTraVac™ Water-Cooled Centrifugal Liquid Chillers (120-500 Tons)	347	See Note 1 Below	FEMP
334512	CVHF	CenTraVac™ Water-Cooled Centrifugal Liquid Chillers (325-2000 Tons)	347	See Note 1 Below	FEMP
334512	CVHL	CenTraVac™ Centrifugal Water-Cooled Chillers - Series L (400-1800 Tons)	347	See Note 1 Below	FEMP
334512	CVHS 	CenTraVac™ Centrifugal Water-Cooled Chillers - Series S (180-390 Tons)	047	See Note 1 Below	FEMP
334512	CDHF 	CenTraVac™ Water-Cooled Centrifugal Liquid Chillers (1500-3950 Tons)	347	See Note 1 Below	FEMP

NOTES:

- (1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the model centrifugal liquid chiller appropriate for the ordering office's needs.
- (2) Centrifugal Chiller models that are configured and selected to achieve an energy efficiency performance better than 0.55 kW/ton are given the "Earthwise™" designation. The purchaser must contact his Trane representative to analyze selection options, chiller performance, pricing, and life-cycle cost benefits in choosing an Earthwise™ model that meets the specific job performance requirements. Earthwise™ chillers conform to the requirements of Executive Order 13123 by being in the top 25th percentile of efficiency for Centrifugal Chiller products sold in the marketplace. Earthwise™ chillers exceed the minimum performance recommendations established by the DOE, Federal Energy Management Program. Trane's Earthwise™ Chiller has received the EPA's Climate Protection Award or being the highest in energy efficiency and lowest in refrigerant emissions.
- (3) Products showing the **FEMP** ecolabel meet Federal Energy Management Program (FEMP) recommended performance standards that are in the upper 25% of energy efficiency of that product group, and required under Federal Acquisition Regulation (FAR) Subpart 23.2.



Air-Cooled Liquid Chillers, Single-Zone Rooftop Air Conditioners, and Split System Air-Cooled Condensing Units

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	YC*, TC*, TE* 	Single-Zone Rooftop Air Conditioners (27 1/2 - 50 tons) Voyager	382	See Note 1 Below	
334512	S*HL 	Single-Zone Rooftop Air Conditioners (20 - 75 tons) IntelliPak	383	See Note 1 Below	
334512	RAUJ 	Split System Air-Cooled Condensing Units (20 - 60 tons)	361	See Note 1 Below	
334512	RAUJ 	Split System Air-Cooled Condensing Units (80 - 120 tons)	362	See Note 1 Below	
334512	CAUC	Split System Air-Cooled Condensing Units (20 - 60 tons)	385	See Note 1 Below	
334512	CAUC	Split System Air-Cooled Condensing Units (80 - 120 tons)	386	See Note 1 Below	
334512	TC* 	Voyager 11 Access - 12.5-25 Ton - Packaged Optional Electric Heat/Cooling Rooftop Unit	463	See Note 1 Below	
334512	WC*	Voyager 11 Access - 12.5-20 Ton - Packaged Heat Pump/Cooling Rooftop Unit	465	See Note 1 Below	
334512	YC* 	Voyager 11 Access - 12.5-25 Ton - Packaged Gas Heat/Cooling Rooftop Unit	467	See Note 1 Below	
334512	BAY*, FIY*	Voyager 11 Access - 12.5-25 Ton - Accessories	390	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Split System Units

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	TWA 	Odyssey Split System Heat Pumps (6-20 Tons, 60 HZ)	411	See Note 1 Below	
334512	TWE 	Odyssey Split System Air Handlers (5-20 Tons, 60 HZ)	416	See Note 1 Below	
334512	TTA 	Odyssey Split System Air Conditioners Handlers (5-20 Tons, 60 HZ)	419	See Note 1 Below	
334512	351	Odyssey Split System Accessoriers	351	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Light Commercial (LCU) & Small Split Systems

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	161	Light Commercial Unit (LCU) Heaters 	161	See Note 1 Below	
334512	425	Accessories for Small Split Systems, Single Phase	425	See Note 1 Below	
334512	428	Small Split System Heat Pumps, Single Phase	428	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Split System Air Handlers

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	391	Small Split System Air Handler Accessories	391	See Note 1 Below	
334512	420	Small Split System Air Handlers, Single Phase, Hyperion & XB TEM	420	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Precedent Rooftop Units

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	Y*C 	Precedent™ GE, 3-10 Tons Gas/Electric Packaged Rooftop Unit, 3 phase 60Hz	514	See Note 1 Below	
334512	WSC	Precedent™ HP, 3-10 Tons Heat Pump Packaged Rooftop Unit, 3 phase 60Hz	516	See Note 1 Below	
334512	T*C 	Precedent™ AC 3-10 Tons Cooling Packaged Rooftop Unit, 3 phase 60Hz	518	See Note 1 Below	
334512	Y*C 	Precedent™ Packaged Rooftop AC products, 3-5 Tons, Gas/Electric, single phase 60 Hz	513	See Note 1 Below	
334512	WSC 	Precedent™ Packaged Rooftop AC products, 3-5 Tons, Heat Pump, single phase 60 Hz	515	See Note 1 Below	
334512	T*C 	Precedent™ Packaged Rooftop AC products, 3-5 Tons, Cooling, single phase 60 Hz	517	See Note 1 Below	
334512	BAY*, SEN*	Precedent G/E - 3-10 Ton Accessories	289	See Note 1 Below	
334512	YHC**7 	Precedent™ 17 Plus Packaged Rooftop Air Conditioner, 17.5 SEER, 3-5 Tons, Gas/Electric, 3 phase 60 Hz	514	See Note 1 Below	
334512	THC**7 	Precedent™ 17 Plus Packaged Rooftop Air Conditioner, 17.5 SEER, 3-5 Tons, Cooling, 3 phase 60 Hz	518	See Note 1 Below	
334512	YZC	Precedent™ eFlex™Technology Packaged Rooftop Air Conditioners, 20 SEER, 3 – 5 Tons, DX Cooling and gas heat and, 3 phase 60 Hz	514	See Note 1 Below	
334512	TZC	Precedent™ eFlex™Technology Packaged Rooftop Air Conditioners, 20 SEER, 3 – 5 Tons, DX Cooling and electric heat, 3 phase 60 Hz	518	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.

Climate Change Air Handlers



SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	50 	Performance Climate Changer™ Air Handler - Unit Sizes 3- 120.	50	See Note 1 Below	
334512	200	Low Voltage Controls for Climate Changer Air Handling Units	200	See Note 1 Below	
334512	958 	Performance Climate Changers air handler UCCA	958	See Note 1 Below	
334512	959	Performance Climate Changers air handler controls	959	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Water Source Heat Pumps

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
Commercial Premium Efficiency					
334512	EXVE 	Water Source Heat Pumps - High Efficiency Vertical	176	See Note 1 Below	
334512	EXHE 	Water Source Heat Pumps - High Efficiency Horizontal	176	See Note 1 Below	
Commercial High Efficiency					
334512	EXWE 	Water Source Heat Pumps - Commercial High Efficiency Water-to-water	75	See Note 1 Below	
334512	GEVE	Water Source Heat Pumps - Vertical	331	See Note 1 Below	
334512	GEHE 	Water Source Heat Pumps - Horizontal	331	See Note 1 Below	
334512	GECE 	Water Source Heat Pumps - High Efficiency Console	331	See Note 1 Below	
334512	GETE 	Water Source Heat Pump - Vertical Stack	332	See Note 1 Below	
334512	Controls	Water Source Heat Pumps - Optional Factory Mounted Controls	126	See Note 1 Below	

NOTES:

- (1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.
 (2) All Units include Condensate Overflow, Copper Heat Exchanger and 24V Controls.



Unit Ventilators

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	VUVB 	Vertical Classroom Unit Ventilators	042	See Note 1 Below	
334512	HUVB 	Horizontal Classroom Unit Ventilators	042	See Note 1 Below	
334512	SHLA	Unit Ventilator Shelving and Accessories	077	See Note 1 Below	
334512	Wall Boxes	Unit Ventilator Accessories	077	See Note 1 Below	
334512	SWE	Unit Ventilator Sidewall Exhaust	077	See Note 1 Below	
334512	Controls	Unit Ventilator Controls	242	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Coil Products

SIN	Model Number	Product Description	Product Code	GSA Price	Ecolabel
334512	081	Cooling Coils	081	See Note 1 Below	
334512	082	Heating Coils	082	See Note 1 Below	
334512	223	UniTrane Fan Coil Controls	223	See Note 1 Below	
334512	FF 	Force-Flo Cabinet Heater	277	See Note 1 Below	
334512	FC 	UniTrane Fan-Coil	278	See Note 1 Below	
334512	BC 	Blower Coil Air Handler	290	See Note 1 Below	
334512	292	Blower Coil Controls	292	See Note 1 Below	

NOTES:

(1) GSA Pricing: A Customer should contact Trane for information on pricing and equipment specifications and configurations for the products to ensure appropriate for the ordering office's needs.



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
ZN511 Products				
334512	4950 0469	Tracer ZN511 Zone Controller with Plastic Cover	100	\$213.47
				
334512	4950 0569	Tracer ZN511 Zone Controller with Metal Enclosure	100	\$267.65
MP501 Products				
334512	4950 0486	Tracer MP501 Setpoint Controller with Plastic Cover	103	\$212.39
				
334512	4950 0586	Tracer MP501 Setpoint Controller w/ Metal Enclosure	103	\$266.57
Service Tools				
334512	4020 1199	Rover-Software Upgrade Package (s/w)	104	\$213.30
334512	X1365149701	Rover LonTalk Hardware Kit	104	\$1,012.07
334512	X1365149801	Rover Comm4 Hardware Kit	104	\$425.60
334512	X1365150001	Rover LonTalk & Comm4 Software and Hardware	104	\$1,560.68
334512	X1365149901	Rover LonTalk Software and Hardware	104	\$1,063.99
334512	X1365150201	Rover LonTalk Configuration Only Software and	104	\$851.19
334512	X1365150301	Rover Air and Water Balancing Only	104	\$993.90
334512	X1365150101	Rover Comm4 Software and Hardware	104	\$709.50
334512	X4509148201	Kit - Tracer TU for Chillers	104	\$1,305.36
334512	X4509151201	Kit - Tracer TU Controls	104	\$1,541.56
334512	X4509151301	Kit - Tracer TU Complete	104	\$2,569.27
334512	X4509153601	Tracer TU Balancing Tool	104	\$221.69
End Devices and Sensors				
334512	3430 3017	24 VAC/SPDT Relay Only	107	\$10.28
334512	3430 3020	24 VAC/SPDT Relay with Enclosure	107	\$20.15
334512	3580 3005	24 VAC Wall Plug-in Transformer	107	\$14.39
334512	3581 2021	UL Component Recognized Transformer 120/208/240 VAC, 75 VA	107	\$30.42
334512	3581 2022	UL Component Recognized Transformer 120 VAC, 40 VA	107	\$11.29
334512	4020 1159	5V Differential Duct Static Pressure Sensor	107	\$57.15
334512	4190 2006	Air Flow Sampling Probe	107	\$6.58
334512	4190 7020	4-20mA 3% Duct Humidity Sensor	107	\$136.87
334512	4190 7021	4-20mA 3% Outside Air Humidity Sensor	107	\$174.73
334512	4190 1080	Balco Transmitter - use w/ PCM AI 3-6	107	\$64.55
334512	4190 1084	Low Temp. Cutout Manual Reset	107	\$92.71
334512	4190 1096	0-50 PSID Diff. Pressure Sensor	107	\$410.31
334512	4190 1097	Electric to Pneumatic Transducer w/ Override	107	\$112.65
334512	4190 1104	4" Brass Immersion Well	107	\$22.61
334512	4190 1106	375 Platinum Outdoor Air Temp w/ Enclosure	107	\$22.52
334512	4190 1108	4" Stainless Steel Immersion Well	107	\$26.73
334512	4190 1100	Therm. Sealed Temp. Sensor	107	\$11.10
334512	4190 1101	Therm. Outdoor Air Temp Sensor	107	\$22.61
334512	4190 1112	6" Brass Immersion Well	107	\$24.67
334512	4190 1113	6" Stainless Steel Imm Well	107	\$30.83
334512	4190 1114	Thermal Well Compound	107	\$12.33
334512	4190 1119	385 Plat Duct Avg 24'	107	\$100.73
334512	4190 1122	20' Averaging Duct Temperature Sensor	107	\$94.56
334512	4190 1123	6' Averaging Duct Temperature Sensor	107	\$66.60
334512	4190 1129	4" Thermistor Duct 6' Lead Temperature Sensor	107	\$22.61
334512	4190 1130	4" Balco Duct/Immersion Temperature Sensor	107	\$42.73
334512	4190 1131	4" 375 Platinum Duct/Immersion Temperature Sensor	107	\$34.66
334512	4190 1132	4" Thermistor Duct/Immersion Temperature Sensor	107	\$22.61



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
334512	4190 1133	6" Thermistor Duct/Immersion Temperature Sensor	107	\$24.67
334512	4190 1134	12" Thermistor Duct Temperature Sensor	107	\$27.01
334512	4190 5005	Water Differential Pressure Switch	107	\$69.48
334512	4190 5050	Building Static Pressure Sensor Selectable	107	\$125.39
334512	4190 5051	Duct Static Pressure Sensor Selectable	107	\$125.39
334512	4190 6006	Air Differential Pressure Switch	107	\$23.84
334512	4190 7015	Stainless Steel Therm. Wall Plate w/ Logo	107	\$11.51
334512	X13310270	Current Sensing Switch	107	\$62.48
334512	X1351152801	Zone Sensor (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$17.68
334512	X1351153001	Zone Sensor w/ On + Cancel (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$17.68
334512	X1351152701	Zone Sensor w/ On + Cancel + Set. Adj. (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$31.24
334512	X1351152901	Zone Sensor w/ Set. Adj. (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$31.24
334512	X1316105702	Thumbwheel Hot/Cold (Qty 12 per box)	107	\$5.58
334512	X1365146702	Comm. Module, Zone Sensor (Box of 12) (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$37.15
334512	X13790422010	CO2 Demand Vent Wall Sensor	107	\$193.17
334512	X13790423010	CO2 Demand Vent Duct Sensor	107	\$182.13
334512	X1379044401	Zone Sensor Comb RH Temp 3% 4-20 mA	107	\$115.90
334512	X1379087901	Zone Sensor RH 5% 20-4 mA	107	\$90.45
334512	X1379084201	Zone Sen Set TOV 3SpFan (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$40.29
334512	X1379084501	Zone Sen Set TOV Fan	107	\$40.29
334512	X1379084801	Zone Sen Set TOV 2SpFan (This product is only available as an optional component (part) of a Trane total solution for a Heating Ventilation Air Conditioning (HVAC) system. It is not available for individual purchase.)	107	\$40.29
Building Control Unit				
334512	4020 1095	CCP Upgrade ROM Kit	115	\$20.75
334512	4020 1204	BMTX Internal Modem	115	\$294.04
334512	4020 1224	BMTX BCU Operator Display Upgrade Kit	115	\$1,397.36
334512	4950 0457	Comm 5 Repeater	115	\$363.22
334512	BMTX001AAD000	Tracer Summit BMTX (Enhanced BCU), Power = 120 VAC	115	\$6,008.86





Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
334512	BMTX001AAD001	Tracer Summit BMTX (Enhanced BCU), Power = 120 VAC, with Internal Modem	115	\$6,302.46
				
334512	BMTX001AAD010	Tracer Summit BMTX (Enhanced BCU), Power = 120 VAC, with Operator Display	115	\$7,405.78
				
334512	BMTX001AAD011	Tracer Summit BMTX (Enhanced BCU), Power = 120 VAC, with Operator Display and Internal Modem	115	\$7,699.82
				
334512	BMTX001BAD000	Tracer Summit BMTX (Enhanced BCU), Power = 230 VAC	115	\$6,008.86
				
334512	BMTX001BAD001	Tracer Summit BMTX (Enhanced BCU), Power = 230 VAC, with Internal Modem	115	\$6,302.46
				
334512	BMTX001BAD010	Tracer Summit BMTX (Enhanced BCU), Power = 230 VAC, with Operator Display	115	\$7,405.78
				
334512	BMTX001BAD011	Tracer Summit BMTX (Enhanced BCU), Power = 230 VAC, with Operator Display and Internal Modem	115	\$7,699.82
				
334512	BMTX001CAD000	Tracer Summit BMTX (Enhanced BCU), Frame Mount - CE Listed (24V)	115	\$6,008.86
334512	BMTX001CAD001	Tracer Summit BMTX (Enhanced BCU) Frame Mount w/ Modem - CE Listed (24V)	115	\$6,302.46
334512	BMTX001EAD000	Tracer Summit BMTX (Enhanced BCU) Frame Mount - UL Listed (24V)	115	\$6,008.86
334512	BMTX001EAD001	Tracer Summit BMTX (Enhanced BCU) Frame Mount w/ Modem - UL Listed (24V)	115	\$6,302.46
334512	4950 0531	BMTX Retrofit kit for BMTS & BMTW BCU	115	\$6,008.86
334512	4950 0535	BMTX Retrofit kit for BMTS & BMTW BCU with modem	115	\$6,302.46
334512	4950 0534	BMTX retrofit kit for Tracer 100 with modem	115	\$6,302.46
334512	4950 0532	BMTX retrofit kit for Tracer 100	115	\$6,008.86



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
Trace Communications Bridges				
334512	X13651587010	Bridge - Comm2	159	\$1,926.96
334512	X13651612010	Tracer Communication Bridge (Comm3 & Comm4): BMTW & BMTS to BMTB Retrofit Kit	159	\$1,043.02
334512	X13651613010	Tracer Communication Bridge (Comm3 & Comm4): BMTB Frame Mount	159	\$1,560.68
334512	X13651614010	Tracer Communication Bridge (Comm3 & Comm4): Tracer 100 to BMTB Retrofit Kit	159	\$1,063.99
334512	BMTB001AAA000	Tracer Communication Bridge (Comm3 & Comm4): BMTB with Enclosure 120VAC	159	\$1,043.02
334512	BMTB001BAA000	Tracer Communication Bridge (Comm3 & Comm4): BMTB with Enclosure 230VAC	159	\$1,043.02
334512	BMSB001AAA000	Tracer Communication Bridge (Comm3 & Comm4): Bridge Bundle Tracer SC, BMTB Bridge, PM014, 120V	159	\$1,850.18
334512	BMSB001AAA010	Tracer Communication Bridge (Comm3 & Comm4): Bridge Bundle Tracer SC, BMTB Bridge, UC400, PM014, 120V	159	\$2,012.66
Tracer Summit Software				
334512	4020 1111	Tracer Summit Current Version Work Package (Windows)	131	\$2,137.32
334512	4020 1112	Tracer Summit Current Version Work Demo Package (Windows)	131	\$42.83
334512	4020 1113	Tracer Summit Current Version Software Upgrade	131	\$568.66
334512	4020 1150	Summit + T100/Tracker Package	131	\$2,413.26
334512	4020 1151	T100/Comm Package	131	\$277.26
334512	4020 1152	Summit + Building Management Package	131	\$2,650.79
334512	4020 1153	Building Management Package	131	\$514.35
334512	4020 1154	Summit PCSW and Enterprise Management	131	\$4,162.94
334512	4020 1155	Summit Enterprise Management Add-On	131	\$2,026.06
Tracker Hardware and Software				
334512	4020 1185	Tracker PC Software	179	\$160.38
334512	4020 1238	Tracker 12 LAN Upgrade	179	\$650.17
334512	4020 1239	Tracker 24 LAN Upgrade	179	\$1,025.10
334512	BMTK000AAB0110	Building Management Tracker (BMTK): Model 12	179	\$1,217.11
334512	BMTK000AAB0210	Building Management Tracker (BMTK): Model 24	179	\$1,898.49
334512	BMTK000ABB0110	Building Management Tracker (BMTK): Model 12 with Ethernet and Modem	179	\$1,560.40
334512	BMTK000ABB0210	Building Management Tracker (BMTK): Model 24 with Ethernet and Modem	179	\$2,241.78
Legacy Controllers				
334512	35914260	RJ12 to RJ12 Interface Cable	182	\$19.54
334512	35914262	9-Pin Female for PC	182	\$19.54
334512	35914263	25-Pin Female for PC	182	\$19.54
334512	35914270	9 Pin to 25 Pin Adapter, 25 to 25 Pin Cable	182	\$37.93
334512	3591 4269	RJ12 to DB25 Male (Modem)	182	\$19.54
334512	4950 0341	Transformer/Relay Enclosure	182	\$160.35
334512	4950 0345	Large Rooftop Interface	182	\$266.46
334512	4950 0372	TCM: Std Ambient, Resin Enclosure	182	\$301.02
334512	4950 0373	TCM: Ext Ambient, NEMA 1 Enclosure	182	\$345.67
334512	4950 0374	TCM: Ext Ambient, NEMA 4 Enclosure	182	\$432.57
VariTrac Central Control Panel				
334512	X13650939010	Central Control Panel with Operator Display	183	\$711.93
334512	X13650941010	Central Control Panel without Operator Display	183	\$435.57
334512	X13760015010	Operator Display Panel Only	183	\$286.84
334512	X13650943010	Central Control Panel Relay Kit (New)	183	\$84.99
334512	X13650576010	Binary Input Controller	183	\$354.83



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
MP581 Products				
334512	4020 1156	Operator Display Upgrade	187	\$679.89
334512	4020 1157	MP580/581 Elec Board Only	187	\$1,047.88
334512	4020 1180	Portable Programming Stand	187	\$117.03
334512	4950 0468	Wall Mount Operator Display	187	\$705.78
334512	4950 0491	Portable Operator Display with Case	187	\$764.96
334512	BMTM000AAD00	Input Power Supply: 120 VAC, with Enclosure, No Display	187	\$910.03
334512	BMTM000AAD01	Input Power Supply: 120 VAC, with Enclosure and Touch Screen Operator Display	187	\$1,406.52
				
334512	BMTM000BAD00	Input Power Supply: 230 VAC, with Enclosure, No Display	187	\$910.03
				
334512	BMTM000BAD01	Input Power Supply: 230 VAC, with Enclosure and Touch Screen Operator Display	187	\$1,406.52
				
334512	BMTM000CAD00	Input Power Supply: 230 VAC, Frame Mount, No Display	187	\$744.73
Tracer UC600				
334512	BMUC600USA0100011	TracerUC600 Controller	536	\$652.89
				
334512	X1365153801	24 VAC to 1.4A 24 VDC	536	\$108.83
334512	X13651571010	Tracer TD7 Display	536	\$478.50
				
334512	X18210613010	TD7 Portable Carry Case	536	\$56.43
334512	X05010511010	Vesa Mount for Display	536	\$26.20
ZN517 Products				
334512	4950 0496	Tracer ZN517 Unitary Controller with Plastic Cover	639	\$363.45
				
334512	4950 0596	Tracer ZN517 Unitary Controller with Metal Enclosure	639	\$428.46
VV551 Products				
334512	4020 1219	Tracer VV551 Single Duct VAV Controller	640	\$231.30
334512	4020 1220	Tracer VV551 Single Duct VAV Controller w/ Belimo Actuator	640	\$278.03
334512	4020 1221	Tracer VV551 Single Duct VAV Controller w/ Trane Actuator	640	\$251.55



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
MP503 Products				
334512	4950 0490	Tracer MP503 Setpoint Controller with Plastic Cover	641	\$327.31
				
334512	4950 0590	Tracer MP503 Setpoint Controller w/ Metal Enclosure	641	\$388.95
EX2 Products				
334512	4950 0499	EX2 Expansion Module with Plastic Cover	642	\$479.94
				
334512	4950 0500	EX2 Expansion Module with Metal Enclosure	642	\$531.24
Enterprise Server				
334512	X40250141001	Tracer ES Express Windows	643	\$3,334.38
334512	X4025010401	Tracer ES License (Unlimited)	643	\$39,012.36
334512	X40250126010	Tracer ES Full with 1 License	643	\$2,364.38
334512	X40250125010	Tracer ES Additional License	643	\$562.95
334512	X40250129010	Tracer ES Software Maintenance Plan (SMP) 1 Year	643	\$861.31
334512	X4025010701	Tracer ES Express Tower Server with 1 License	643	\$3,595.78
334512	X40250129020	Tracer ES Software Maintenance Plan (SMP) 2 Years	643	\$1,378.10
334512	X40250129030	Tracer ES Software Maintenance Plan (SMP) 3 Years	643	\$1,550.36
334512	X40250130010	Tracer ES Unlimited SMP 1 Year	643	\$8,613.10
334512	X40250131010	Tracer ES Renewal for Expired SMP Plan	643	\$287.11
ZN521 Products				
334512	4950 0470	Tracer ZN521 Zone Controller with Plastic Cover	645	\$311.60
				
334512	4950 0570	Tracer ZN521 Zone Controller with Metal Enclosure	645	\$370.28
Trane Connectivity Module				
334512	X13651569010	Connectivity Module	668	\$711.30
Trane UC210				
334512	BMUC210ACA0T00011	Preprogrammed UC210 for Bypass Control	898	\$190.13
				
334512	BMUC210AAA0100011	UC210 VAV Controller w/out Actuator	898	\$191.40
				
334512	BMUC210AAA0T00011	UC210 VAV Controller w/ Trane Actuator	898	\$208.29
				
334512	BMUC210AAA0B00011	UC210 VAV Controller w/ Belimo Actuator	898	\$230.81
				



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
Tracer XT				
334512	X45091562010	Tracer XT Software Kit, 700 I/O pts. 200 Historian Tags	949	\$18,596.17
334512	X45091562020	Tracer XT Software Kit, 1,500 I/O pts. 300 Historian Tags	949	\$30,064.15
334512	X45091562030	Tracer XT Software Kit, 35,000 I/O pts. 600 Historian	949	\$38,258.42
Tracer SC				
334512	BMSC000AAA011000	Tracer SC w/ Power Supply and Base License	1009	\$780.95
				
334512	BMCF000AAA0AE00	15 Device Application License	1009	\$496.69
Wireless Controls				
334512	X13790963010	WCI BAA	1247	\$191.32
				
334512	X13790964010	WCI Outdoor BAA	1247	\$217.07
				
334512	X13790968010	WCS-SD BAA (Display Sensor)	1247	\$96.12
				
334512	X13790969010	WCS-SB BAA (Base Sensor)	1247	\$65.31
				
334512	X13790973010	WCS-SH (2% Humidity Module)	1247	\$95.59
				
XM Expansion Modules				
334512	X13651563010	XM32 Module (4 Relay)	1250	\$160.75
				
334512	X13651537010	XM30 I/O Module (4 UI/AO)	1250	\$160.75
				



Building Energy Management & Control Products

SIN Number	Model Number	Product Description	Product Code	GSA Price
334512	X13651597010	XM70 (8UI, 6UI/AO, 4R, 1P)	1250	\$503.05
				
		Enclosures		
334512	501897940100	Metal Enclosure, UC210	1251	\$17.74
334512	X19091354010	10" DIN Rail Enclosure	1251	\$76.84
334512	X13651559010	13" DIN Rail Enclosure 120 V	1251	\$177.33
334512	X13651560010	13" DIN Rail Enclosure 230V	1251	\$177.33
334512	X13651552010	24" DIN Rail Enclosure 120V	1251	\$548.50
334512	X13651554010	24" DIN Rail Enclosure 230V	1251	\$548.50
334512	X13651553010	24" Enclosure Display Mount 120V	1251	\$632.72
334512	X13651555010	24" Enclosure Display Mount 230V	1251	\$632.72
334512	X13651596010	24" Enclosure Solid Door (UUKL) 120 VAC	1251	\$611.56
334512	X13651618010	16" DIN Rail Enclosure Solid Door, 120 VAC	1251	\$277.82
334512	X13651619010	16" Enclosure, Display Door, 120 VAC	1251	\$289.64



**Building Automation Systems (BAS)
Training Seminars
University Course Listing - Pricing**

SIN Number	Course Number	Course Name	Course Length	GSA Price
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Course Descriptions are Attached.

Building Systems & Controls Training

334512	BSC01	Tracer Summit System Operation	3.5 days	\$ 1,550.00
334512	BSC02	Tracer Summit 101	4.5 days	\$ 1,980.00
334512	BSC03	Tracer Summit 102	4.5 days	\$ 1,980.00
334512	BSC04	Tracer SC Operation	2.5 days	\$1,320.00
334512	BSC05	Tracer SC Advanced Operation	3 days	\$ 1,320.00
334512	BSC09	Tracer Ensemble Operation	2.5 days	\$ 1,320.00

Technical Service Training

334512	TS01	Air Conditioning Service	4.5 days	\$ 1,800.00
334512	TS02	Commercial Service I	4.5 days	\$ 1,800.00
334512	TS03	Airside System Service	4.5 days	\$ 1,800.00
334512	TS04	HVAC Electrical Troubleshooting	4.5 days	\$ 1,800.00
334512	TS05	Chilled Water Systems Service	3.5 days	\$ 1,800.00
334512	TS06	CenTraVac System Operation and	3.5 days	\$ 1,950.00
334512	TS07	CenTraVac Electronic Controls	3.5 days	\$ 1,950.00
334512	TS08	CenTraVac Mechanical Overhaul Service	4.5 days	\$ 3,500.00
334512	TS09	Single Stage Absorption Chillers	4.5 days	\$ 1,900.00
334512	TS10	RTAA Rotary Chillers	3.0 days	\$ 1,950.00
334512	TS11	RTAC Rotary Chillers	3 days	\$ 1,950.00
334512	TS12	RTAE Rotary Chillers	3 days	\$ 1,950.00
334512	TS13	RTHD Rotary Chillers	3 days	\$ 1,950.00
334512	TS14	RTWD Rotary Chillers	3 days	\$ 1,950.00
334512	TS15	Precedent Voyager Rooftops (3-25 ton)	3.5 days	\$ 1,950.00
334512	TS16	IntelliPak I&II Rooftop Units	4.5 days	\$ 1,950.00
334512	TS18	Scroll Chiller Service & Troubleshooting	3.5 days	\$ 1,950.00

Online Classes

334512	TS19	IntelliPak Human Interface Navigation & Status Menu	online	\$ 75.00
334512	TS20	ReliaTel Zone Sensor Testing	online	\$ 75.00

Training Packages

334512	BSC010	Building Systems & Controls Private Class	2.5 days	\$10,000.00
334512	BSC011	Building Systems & Controls Private Class	3 days	\$14,000.00
334512	BSC012	Building Systems & Controls Private Class	3.5 days	\$17,250.00
334512	BSC013	Building Systems & Controls Private Class	4.5 days	\$17,250.00
334512	TS021	Technical Service Private Class	2 days	\$ 6,000.00
334512	TS022	Technical Service Private Class	3 days	\$ 7,500.00
334512	TS023	Technical Service Private Class	4 days	\$ 9,500.00
334512	PTP01	Platinum Training Package	Custom	\$30,000.00
334512	GTP02	Gold Training Package	Custom	\$ 6,000.00

NOTES:

- (1) Building Automation System (BAS): Comprised of all of the components of a building control system that provides comfort, view-ability, operability and control of a commercial building's mechanical and other systems.
- (2) Training Packages: Customer controls attendee list and pays Trane U.S. Inc. a fixed rate dependent upon number of days training requested and type of training listed above. Trane University supplies instructor, all equipment needed, and any teaching materials.



Trane Rental Services

SIN	Model Number	Product for Rent	Product Code	GSA Monthly Rental Rate
Rental of Air Cooled Chillers				
334512	CS-ACC-01	10 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-02	15 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-03	25 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-04	40 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-05	60 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-06	80 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-07	100 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-08	125 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-09	170 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-10	200 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-11	300 Ton Air Cooled Chiller (includes trailer)	197	See Note 14
		400 Ton Air Cooled Chiller (includes trailer, pump, 6" hose box)	197	See Note 14
334512	CS-ACC-12	500 Ton Air Cooled Chiller (includes trailer, pump, 6" hose box)	197	See Note 14
334512	CS-ACC-13	155 Ton Air Cooled Chiller	197	See Note 14
334512	CS-ACC-14	250 Ton Air Cooled Chiller	197	See Note 14
				See Note 14
Rental of Water-Cooled Chillers				
334512	CS-WCC-04	500 Ton Water Cooled Chiller	197	See Note 14
334512	CS-WCC-06	750 Ton Water Cooled Chiller	197	See Note 14
334512	CS-WCC-09	1000 Ton Water Cooled Chiller	197	See Note 14
334512	CS-WCC-11	225 Ton Water Cooled Chiller	197	See Note 14
334512	CS-WCC-12	350 Ton Water Cooled Chiller	197	See Note 14
				See Note 14
Pump Rental				
334512	CS-PU-01	3/5 HP Pump	197	See Note 14
334512	CS-PU-02	7.5/10 HP Pump	197	See Note 14
334512	CS-PU-03	15/20 HP Pump	197	See Note 14
334512	CS-PU-04	25/30 HP Pump	197	See Note 14
334512	CS-PU-05	40/50 HP Pump	197	See Note 14
334512	CS-PU-06	60 HP Pump	197	See Note 14
334512	CS-PU-08	125 HP Pump	197	See Note 14
334512	CS-PU-10	100 HP Pump	197	See Note 14
				See Note 14
Hose Kit Rental				
334512	CS-HK-01	2.5" Diameter Hose Kit; contains 200 total feet	197	See Note 14
334512	CS-HK-02	4" Diameter Hose Kit; contains 200 total feet	197	See Note 14
334512	CS-HK-03	6" Diameter Hose Kit; contains 200 total feet	197	See Note 14
334512	CS-HK-04	8" Diameter Hose Kit; contains 400 total feet	197	See Note 14
334512	CS-HK-05	10" Diameter Hose Kit; contains 200 total feet	197	See Note 14
334512	CS-HK-06	4" Dia Hose Kit for vertical/suction apps 96 ft total	197	See Note 14
				See Note 14
Transformer Rental				
334512	CS-TR-01	300 kVa Transformer	197	See Note 14
334512	CS-TR-02	500 kVa Transformer	197	See Note 14
334512	CS-TR-03	750 kVa Transformer	197	See Note 14
334512	CS-TR-04	1000 kVa Transformer	197	See Note 14
334512	CS-TR-05	1500 kVa Transformer	197	See Note 14
Rental of DX/Voyager (Direct Exchange Refrigerant) Units				
334512	CS-VT-01	10 Ton DX (Direct Exchange Refrigerant) Vertical Tent Unit	197	See Note 14
		20 Ton DX (Direct Exchange Refrigerant) Vertical Tent Unit	197	See Note 14
334512	CS-VT-02	25 Ton DX/Voyager (Direct Exchange Refrigerant) Unit	197	See Note 14
334512	CS-DX-01	35 Ton DX/Voyager (Direct Exchange Refrigerant) Unit	197	See Note 14
334512	CS-DX-02	50 Ton DX/Voyager (Direct Exchange Refrigerant) Unit	197	See Note 14
				See Note 14
Tower Rental				
334512	CS-TO-01	500 Ton Tower (mounted on 48 foot step-deck trailer)	197	See Note 14
334512	CS-TO-03	270 Ton Tower NO TRAILER	197	See Note 14
334512	CS-TO-04	750 Ton Tower (mounted on 48 foot step-deck trailer)	197	See Note 14



Trane Rental Services

SIN	Model Number	Product for Rent	Product Code	GSA Monthly Rental Rate
Air Handling Unit (AHU) Rental				
334512	CS-AHU-01	5000 cfm AHU	197	See Note 14
334512	CS-AHU-02	10000 cfm AHU	197	See Note 14
334512	CS-AHU-03	25000 cfm AHU	197	See Note 14
Flex Duct Rental				
334512	CS-FD-01	20" Flex Duct [contains (4) 25 foot sections of Flex]	197	See Note 14
334512	CS-FD-02	12" Flex Duct [contains (4) 25 foot sections Black]	197	See Note 14
334512	CS-FD-03	12" Flex Duct [contains (4) 25 foot sections White]	197	See Note 14
Rental of Electric Cable				
334512	CS-EC-01	2/0 Cable Box (4) 100' Sections of Electric Cable	197	See Note 14
334512	CS-EC-02	4/0 Cable Box (4) 100' Section of Electric Cable	197	See Note 14
Trailer Rental				
334512	CS-TA-01	48 foot Flatbed Trailer	197	See Note 14
334512	CS-TA-02	28 foot Flatbed Trailer	197	See Note 14
334512	CS-TA-03	32 foot Flatbed Trailer	197	See Note 14
334512	CS-TA-04	48 or 53 ft Step Deck Trailer	197	See Note 14
Rental of Generators - Standby Rate				
334512	SR36	36kW Generator - standby rate	197	See Note 14
334512	SR60	60kW Generator - standby rate	197	See Note 14
334512	SR100	100kW Generator - standby rate	197	See Note 14
334512	SR120	120kW Generator - standby rate	197	See Note 14
334512	SR140	140kW Generator - standby rate	197	See Note 14
334512	SR200	200kW Generator - standby rate	197	See Note 14
334512	SR350	350kW Generator - standby rate	197	See Note 14
334512	SR450	450kW Generator - standby rate	197	See Note 14
334512	SR500	500kW Generator - standby rate	197	See Note 14
334512	SR750	750KW Generator - standby rate	197	See Note 14
334512	SR1125	1125kW Generator - standby rate	197	See Note 14
334512	SR1450	1450kW Generator - standby rate	197	See Note 14
Rental of Generators - 8 hour Run Rate				
334512	08H36	36kW Generator - 8 hour run rate	197	See Note 14
334512	08H60	60kW Generator - 8 hour run rate	197	See Note 14
334512	08H100	100kW Generator - 8 hour run rate	197	See Note 14
334512	08H120	120kW Generator - 8 hour run rate	197	See Note 14
334512	08H140	140kW Generator - 8 hour run rate	197	See Note 14
334512	08H200	200kW Generator - 8 hour run rate	197	See Note 14
334512	08H350	350kW Generator - 8 hour run rate	197	See Note 14
334512	08H450	450kW Generator - 8 hour run rate	197	See Note 14
334512	08H500	500kW Generator - 8 hour run rate	197	See Note 14
334512	08H750	750KW Generator - 8 hour run rate	197	See Note 14
334512	08H1125	1125kW Generator - 8 hour run rate	197	See Note 14
334512	08H1450	1450kW Generator - 8 hour run rate	197	See Note 14
Rental of Generators - 16 hour Run Rate				
334512	16H36	36kW Generator - 16 hour run rate	197	See Note 14
334512	16H60	60kW Generator - 16 hour run rate	197	See Note 14
334512	16H100	100kW Generator - 16 hour run rate	197	See Note 14
334512	16H120	120kW Generator - 16 hour run rate	197	See Note 14
334512	16H140	140kW Generator - 16 hour run rate	197	See Note 14
334512	16H200	200kW Generator - 16 hour run rate	197	See Note 14
334512	16H350	350kW Generator - 16 hour run rate	197	See Note 14
334512	16H450	450kW Generator - 16 hour run rate	197	See Note 14
334512	16H500	500kW Generator - 16 hour run rate	197	See Note 14
334512	16H750	900750KW Generator - 16 hour run rate	197	See Note 14
334512	16H1125	1125kW Generator - 16 hour run rate	197	See Note 14
334512	16H1450	1450kW Generator - 16 hour run rate	197	See Note 14
Rental of Generators - 24 hour Run Rate				
334512	24H36	36kW Generator - 24 hour run rate	197	See Note 14



Trane Rental Services

SIN	Model Number	Product for Rent	Product Code	GSA Monthly Rental Rate
334512	24H60	60kW Generator - 24 hour run rate	197	See Note 14
334512	24H100	100kW Generator - 24 hour run rate	197	See Note 14
334512	24H120	120kW Generator - 24 hour run rate	197	See Note 14
334512	24H140	140kW Generator - 24 hour run rate	197	See Note 14
334512	24H200	200kW Generator - 24 hour run rate	197	See Note 14
334512	24H350	350kW Generator - 24 hour run rate	197	See Note 14
334512	24H450	450kW Generator - 24 hour run rate	197	See Note 14
334512	24H500	500kW Generator - 24 hour run rate	197	See Note 14
334512	24H750	750KW Generator - 24 hour run rate	197	See Note 14
334512	24H1450	1450kW Generator - 24 hour run rate	197	See Note 14



Trane Rental Services

NOTES:

- (1) The total monthly Rental Rate equals the GSA Monthly Rental Rate multiplied by both the Time of Year Multiplier and the Multi-Month Rental Multiplier.
- (2) The **Time of Year Multiplier** is set out in the Table below.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Discount	0.8	0.8	0.8	0.8	1	1	1	1	0.9	0.8	0.8	0.8

- (3) The **Multi-Month Rental Multiplier** is set out in the Table below.

Months	< 2	3 - 6	> 7
Multiplier	1	0.85	0.75

- (4) The Time of Year and Multi-Month Rental Multipliers are not applied to the Rental Rate for Electric Cable.
- (5) For rental periods that include partial months, the Rental Rates will be calculated as follows:

First Month

Weekly Rate	1/3 Monthly Rate
Daily Rate	1/3 Weekly Rate

Ending Month

Weekly Rate	1/3 Monthly Rate
Daily Rate	1/3 Weekly Rate

- (6) **Freight Charges** - Equipment is to be shipped from and returned to Trane designated storage locations with outbound and return freight prepaid by Trane.
- (7) **Transformers** - Lugs for transformers must be provided by others and are not included. Transformers kVA 300, 500, 750 are for 208, 240, 480, & 600 Volts. Transformers kVa 1,000 & 1,500 (and some 750's) are for 480, 600, 2400, & 4160 Volts.
- (8) **Electric Cable** - The Time of Year and Multi-Month Rental Multipliers are not applied to the rental rate for Electric Cable. Each 2/0 awg or 4/0 awg cable box contains (4) 100-ft sections, (4) 15-ft male pigtails, and (4) 15-ft female pigtails. If pricing electrical cable boxes please note multiple runs per phase might be required depending on the actual unit chosen. Please call Trane Rental Services at 800-755-5115 for any electrical questions regarding Trane Rental cable boxes. Wiring is only provided for 460V side. If a transformer is required the wiring for the building side must be provided by others.
- (9) **Chillers** - 300-ton Air-Cooled chiller pricing includes trailer and chiller is on trailer. 400-ton and 500-ton Air-Cooled chiller pricing includes trailer, pump, and 200-ft hose kit of 6-in hose. All Water-Cooled chillers are stored in Charlotte, NC and ship with a Nitrogen holding charge. Refrigerant will be shipped in cylinders on the trailer. The chiller will need to be charged at delivery and the refrigerant recovered before it is sent back.
- (10) **Pumps** - Pumps do not have wiring. This must be provided by others.
- (11) **Ancillary Items** - Items such as pumps, hose kits, transformers, trailers, and electrical cable can only be rented with a chiller or DX unit. Trane Rentals does not rent these items as stand-alone items.
- (12) **Generator Freight Charges** - Generator freight is not included in the generator rental rates. Roundtrip freight for generators will be based on actual freight charges. An estimate of the freight charges can be provided at the time the rental agreement is executed.
- (13) **Generator Fueling** - Is not included in the rental rates above and is the responsibility of the Customer.
- (14) **GSA Monthly Rental Rate**. A Customer should contact Trane for information on pricing and equipment specifications and configurations for Rental products to ensure appropriate for the ordering office's needs.



Customer Direct Services (CDS) Software
Software Description Literature is Attached

SIN Number	Product Description	GSA Price for Standard License (Part Number)	GSA Price for Additional License/Seat (Part Number)	GSA Price for LAN/Site License (Part Number)
334512	TRACE® 700	\$1,995.00 CDS-PKG-C	\$995.00 CDS-PKG-C1	\$3,990.00 CDS-PKG-C2
334512	Trane Acoustics Program (TAP™)	\$495.00 CDS-PKG-D	\$248.74 CDS-PKG-D1	\$742.50 CDS-PKG-D2
334512	System Analyzer™	\$995.00 CDS-PKG-W	\$500.00 CDS-PKG-W1	\$1,492.50 CDS-PKG-W2
334512	TRACE 700 Load Design	\$695.00 CDS-PKG-A	\$349.24 CDS-PKG-A1	\$1,042.50 CDS-PKG-A2
334512	Trace 700 Load Express™ (Version 4.1.1)	\$495.00 CDS-PKG-T	\$248.74 CDS-PKG-T1	\$742.50 CDS-PKG-T2
334512	TRACE 700 Chiller Plant Analyzer	\$495.00 CDS-PKG-CPA	\$248.74 CDS-PKG-CPA1	\$742.50 CDS-PKG-CPA2
334512	VariTrane™ Duct Designer	\$495.00 CDS-PKG-L	\$248.74 CDS-PKG-L1	\$742.50 CDS-PKG-L2
334512	Trane® Pipe Designer	\$195.00 CDS-PKG-P	\$97.99 CDS-PKG-P1	\$292.50 CDS-PKG-P2
334512	Distribution Suite	\$595.00 CDS-PKG-E	\$298.99 CDS-PKG-E1	\$892.50 CDS-PKG-E2
334512	Trane® Engineering Toolbox	\$95.00 CDS-PKG-J	\$47.74 CDS-PKG-J1	\$142.50 CDS-PKG-J2
334512	TRACE 700 Family LAN Seats	N/A	N/A	\$75.00 CDS-PKG-FLS
334512	TRACE 3D Plus Load Design	\$845.00 CDS-PKG-X	N/A	N/A
334512	TRACE 3D Plus Load Design – Limited	N/A	\$145.00 CDS-PKG-X2	\$1,195.00 CDS-PKG-X1
334512	TRACE 3D Plus Load Design - Enterprise	N/A	\$245.00 CDS-PKG-X4	\$2,495.00 CDS-PKG-X3
334512	TRACE 3D Plus Load Design – Global	N/A	Unlimited Included	\$14,995.00 CDS-PKG-X5
334512	TRACE 3D Plus	\$2,345.00 CDS-PKG-Y	N/A	N/A
334512	TRACE 3D Plus – Limited Enterprise	N/A	\$545.00 CDS-PKG-Y2	\$3,195.00 CDS-PKG-Y1
334512	TRACE 3D Plus - Enterprise	N/A	\$645.00 CDS-PKG-Y4	\$6,995.00 CDS-PKG-Y3
334512	TRACE 3D Plus – Global Enterprise	N/A	Unlimited Included	\$39,995.00 CDS-PKG-Y5
334512	Academic License Seats	N/A	\$40.00 CDS-PKG-ALS	N/A

NOTES:

- (1) CDS Software is subject to annual licensing fee billed at 25% of GSA Price. Payment of this fee entitles the license.
- (2) SITE USERS for TRACE 700 family may install software on multiple, standalone computers at on specific location.
- (3) LAN USERS for TRACE 700 family may install software on a LAN. Seats must be purchased for each user.



Customer Direct Service (CDS) Training Seminars

Schedule at La Crosse, Wisconsin Site

SIN Number	Course number	Course Name	Product Code	Course Length		GSA Price for Individual Course w/ IFF	GSA Price for 2 Courses w/ IFF	GSA Price for 3 Courses w/ IFF	GSA Price for 4 Courses w/ IFF	GSA Price for each add'l student for a course w/ IFF
334512	CDS-TRNGL1	System Analyzer™	616	1 Day		\$350.00	\$650.00	\$850.00	\$1,000.00	\$262.50
334512	CDS-TRNGL2	TRACE® 700 Load Design	616	1 Day		\$350.00	\$650.00	\$850.00	\$1,000.00	\$262.50
334512	CDS-TRNGL3	TRACE® 700	616	1 Day		\$350.00	\$650.00	\$850.00	\$1,000.00	\$262.50
334512	CDS-TRNGL4	TRACE 700 Advanced Topics	616	1/2 Days		\$350.00	\$650.00	\$850.00	\$1,000.00	\$262.50

NOTES:

- (1) Customer Direct Service (CDS): Software to assist the engineering community with building and HVAC system design and analysis. CDS sells software licenses, provides technical and engineering support, and training for that software.
 (2) The "GSA Price above for each add'l student for a course w/IFF" is applicable only at Trane's La Crosse, WI location.
 (3) Cancellations must be received two weeks prior to class date by fax, mail or email. \$200 fee for any cancellations by Customer within 2 weeks of the agreed training date. No Shows will be charged full class price. Trane reserves the right to cancel classes due to weather, illness, or any other reason. All students will be notified as early as possible and CDS' liability will be limited to the return of registration fees.

Customer Direct Service (CDS) Training Seminars

Schedule at Customer's Location Site

SIN Number	Course number	Course Name	Product Code	Course Length	GSA Price for Individual Course w/ IFF
334512	CDS-TRNGC1	First Day of Training On-Site or 1-10 people	616	1 Day	\$750.00
334512	CDS-TRNGC1 2	First Day of Training On-Site or 11-15 people	616	1 Day	\$1,000.00
334512	CDS-TRNGC1 3	First Day of Training On-Site or 16-20 people	616	1 Day	\$1,250.00
334512	CDS-TRNGC1 4	First Day of Training On-Site or 21-30 people	616	1 Day	\$1,500.00
334512	CDS-TRNGC2	Each Additional Day of Training for 1-10 people	616	Per Day	\$650.00
334512	CDS-TRNGC2 2	Each Additional Day of Training for 11-15 people	616	Per Day	\$750.00
334512	CDS-TRNGC2 3	Each Additional Day of Training for 16-20 people	616	Per Day	\$1,000.00
334512	CDS-TRNGC2 4	Each Additional Day of Training for 21-30 people	616	Per Day	\$1,250.00
334512	CDS-COMRN T-15	1-5 Computers Rental	616	Per Day	\$400.00
334512	CDS-COMRN T-610	10 Computers Rental	616	Per Day	\$550.00

NOTES:

- (1) Customer Site Training Classes: Same courses on Pg. 37 and the customer determines what they want CDS to provide at their location. Pricing outlined is based on number of days of training and number of attendee/students.
 (2) CDS will rent computers for use by the customer during on-site training.
 (3) **Cancellation Policy** – A \$200 administrative cancellation fee will apply to any cancellations occurring within 2 weeks of the agreed upon training date by Customer.
 (4) For training provided at the customer's location, training shall be provided at the billing rate shown above. The customer shall pay for the trainer's travel and per diem expenses. Rates paid as a result of travel must comply with the Federal Travel Regulations or Joint Travel Regulations, as applicable, in effect on the date(s) the travel is performed.

Customer Direct Service (CDS) Training Seminars

Seminar and Software Purchased Together

SIN Number	Product Number	Description	Product Code	Software Alone	Training Alone	Software & Training Together -
				- GSA Price w/IFF	- GSA Price w/ IFF	GSA Price w/ IFF
334512	CDS-TNG-L700	TRACE® 700 Load Design	616	\$695.00	\$350.00	\$870.00
334512	CDS-TNG-T700	TRACE® 700	616	\$1,995.00	\$350.00	\$2,170.00
334512	CDS-TNG-SA	System Analyzer™	616	\$995.00	\$350.00	\$1,170.00

NOTES:

- (1) Packaged Pricing for the purchase of software and training together is available at Trane's La Crosse, WI site.
 (2) At the end of the La Crosse training seminar, all participants will receive a coupon to save 15% off the regular listed software price. To receive this discount, all software orders must be accompanied by this coupon.



EDUCATIONAL LITERATURE & MATERIALS

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
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AIR CONDITIONING CLINICS

Purpose: Scripted training presentations used to educate on the fundamentals of heating, ventilating, and air conditioning (HVAC). Each clinic includes a student workbook, with corresponding quiz questions/problems.

Audience: The content is technical in nature and the original intended audience was HVAC system designers and installing contractors who wanted to learn the basics of HVAC. However, in the past the audience has been extremely broad and has included HVAC system designers, installing contractors, architects, system operators, servicing technicians, and owners.

Definitions: International System of Units (SI) and/or inch-pound units (IP). Dual units contain both IP/SI.

FUNDAMENTALS SERIES

334290	TRG-TRC001EN	Psychrometric Charting (2000)	IP units only	Discussion of the properties of air and the use of the psychrometric chart. Topics include: sensible and latent heat, heat and moisture change, elements of the psychrometric chart, sensible heat ratio (SHR), determining required airflow (cfm) and refrigeration (tons), analyses of basic systems at full and part load (modulating coil, reheat, face-and-bypass, variable volume).	\$16.00
334290	TRG-TRC002-EN	Cooling and Heating Load Estimating (2000)	Dual units (IP/SI)	Presentation of cooling and heating load estimating procedures to used for accurate HVAC equipment selections. The clinic presents the ASHRAE Cooling Load Temperature Difference (CLTD), Solar Cooling Load Factor (SCL), and Cooling Load Factor (CLF) method. Topics include: human comfort, indoor and outdoor design conditions, cooling load estimation, conduction heat gain and loss, solar heat gain, internal heat gains, infiltration, ventilation, fan heat, heating load estimation, single-space psychrometric analysis (sensible heat ratio or SHR, supply airflow, supply air temperature, coil load), multiple-space psychrometric analysis (block load versus sum-of-peaks), plenum versus space loads, and benefits of computerized load analysis.	\$16.00
334290	TRG-TRC003-EN	Refrigeration Cycle (1999)	Dual units (IP/SI)	Presentation of the basic principles of the vapor-compression refrigeration cycle. Topics include: principles of heat transfer, sensible heat, latent heat of vaporization, refrigerants, mechanical refrigeration cycle components (compressor, condenser, evaporator, expansion device), and pressure-enthalpy (P-h) chart (superheat, subcooling, refrigeration effect, heat of compression).	\$16.00
334290	TRG-TRC004-EN	Refrigeration Compressors (2000)	Dual units (IP/SI)	Introduction of the common compressor types used in air-conditioning applications, including reciprocating, scroll, helical-rotary (screw), and centrifugal. Topics include: review of the basic refrigeration cycle, open, semi-hermetic, hermetic, types of compressors, principles of compressor operation, methods of compressor capacity control (cylinder unloaders, cycling, slide valve, inlet vanes, variable-speed), methods of system-level control (direct expansion versus chilled water, constant volume versus VAV), and preventing evaporator freeze-up (sensing suction temperature, hot gas bypass).	\$16.00
334290	TRG-TRC005-EN	Refrigeration System Components (1998)	Dual units (IP/SI)	Discussion of the components used in a vapor-compression refrigeration system. Topics include: review of the refrigeration cycle, condensers (air-cooled, water-cooled, evaporative) and their control, evaporators (finned-tube, shell-and-tube) and their control, thermostatic expansion valve, superheat and subcooling, solenoid valve, liquid line filter drier, moisture-indicating sight glass, suction line filter, hot gas muffler, shutoff valve, and access ports.	\$16.00
334290	TRG-TRC006-EN	Refrigerant Piping (2002)	Dual units (IP/SI)	Review of refrigeration system piping considerations, design guidelines, and sizing recommendations. Topics include: suction line, discharge (hot gas) line, liquid line, hot gas bypass line, traps, double risers, refrigeration accessories required, insulation.	\$16.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	TRG-TRC007-EN	Fundamentals of HVAC Acoustics (2001)	Dual units (IP/SI)	Discussion of the fundamental concepts of acoustics as it applies to buildings and HVAC systems. Topics include: sound wave, frequency, broadband sound, tones, octave bands, one-third octave bands, sound power and sound pressure, decibels, loudness, A-weighting, Noise Criteria (NC), Room Criteria (RC), sones, phons, acoustical analysis procedure, source-path-receiver model, computerized analysis tools, attenuation and regeneration, sound transmission, sound absorption, sound reflection, room effect, equipment sound rating, free field, reverberent field, semireverberent field, industry rating standards, reverberent room method, ARI Standard 260.	\$16.00
EQUIPMENT SERIES					
334290	TRG-TRC010-EN	Centrifugal Water Chillers (1999)	Dual units (IP/SI)	Description of the components, operation, and application of a centrifugal water chiller. Topics include: centrifugal compressor, condenser, expansion device (orifice plates), economizer, evaporator, motor, starters, controls, the refrigeration cycle, purge system, compressor capacity control (surge, inlet vanes, multi-stage compressor, adjustable frequency drive or variable speed drive), maintenance considerations, and application considerations (condensing temperature control, constant or variable evaporator water flow, heat recovery, free cooling, short water loops, ARI Standard 550/590-1998).	\$16.00
334290	TRG-TRC011-EN	Absorption Water Chillers (2000)	Dual units (IP/SI)	Discussion of the fundamentals of the absorption refrigeration cycle as it pertains to water chillers. Topics include: absorption refrigeration cycle (generator or concentrator, condenser, evaporator, absorber, heat exchanger), system fluids (water, lithium bromide), equilibrium chart, single-effect versus double-effect chillers, indirect-fired versus direct-fired chillers, chiller/heaters, capacity control methods (energy valve, AFD), causes of crystallization and methods of prevention, purge operation, general maintenance considerations (corrosion inhibitors), cooling-water temperature limitations, combination gas-and-electric plants, special considerations for direct-fired chillers, ASHRAE Standard 15, and ARI Standard 560.	\$16.00
334290	TRG-TRC012-EN	Helical-Rotary Water Chillers (1999)	Dual units (IP/SI)	Presentation of the components, operation, and application of a helical-rotary (screw) water chiller. Topics include: helical-rotary compressor, oil separator, condenser (water-cooled and air-cooled), expansion device, liquid/vapor separator, evaporator, starter, controls, the refrigeration cycle, refrigerants, compressor capacity control, slide valve operation, maintenance considerations, and a brief list of application considerations (air-cooled or water-cooled condensing, condensing temperature control, constant or variable evaporator water flow, short water loops, ARI Standard 550/590-1998).	\$16.00
334290	TRG-TRC013-EN	Air Conditioning Fans (2004)	Dual units (IP/SI)	Coverage of fan system performance, types of fans, and methods of control. Topics include: static pressure vs. velocity pressure, fan performance curves, fan—system interaction, basic types of fans (forward curved - FC, backward inclined - BI, airfoil - AF, vaneaxial, and variable-pitch vaneaxial - VPVA), methods of fan control (riding the fan curve, discharge dampers, inlet vanes, variable speed, and variable-pitch blade control), and fan applications considerations (static pressure control, system effects, non-standard conditions – altitude, and equipment certification standards.).	\$12.00

SYSTEMS SERIES

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	TRG-TRC014-EN	VAV Systems (2001)	Dual units (IP/SI)	Summary of the variable air volume (VAV) approach to air conditioning. Topics include: explanation of VAV, components of a VAV system, terminal unit types (cooling only, reheat, parallel and series fan powered, dual duct), terminal unit controllers (pneumatic, electronic, DDC), diffusers, supply duct design, interior vs. perimeter spaces, system control modes, fan modulation, static pressure control, and system applications considerations (system-level ventilation, freeze protection for coils, part-load space humidity control, building pressure control.).	\$16.00
334290	TRG-TRC015-EN	Water-Source Heat Pump Systems (2000)	Dual units (IP/SI)	Discussion of the water-source heat pump (WSHP) system. Topics include: operation and components of a heat pump, types of heat pumps, components of a WSHP system, system benefits and issues, system configurations (cooling tower/boiler, ground-coupled, types of ground heat exchangers, hybrid systems), system-level control issues, maintenance considerations, application considerations (ventilation, acoustics, space humidity control, condensate management, airside and waterside economizers, building pressurization, equipment rating standards.).	\$16.00
334290	TRG-TRC016-EN	Chilled-Water Systems (2001)	Dual units (IP/SI)	Description of chilled-water systems. Topics include: vapor-compression and absorption chiller types, air-cooled vs. water-cooled condensers, packaged vs. split components, ASHRAE Standard 90.1-1999, equipment rating standards (ARI 550, 590, and 560), components of a chilled-water system, coil control (3-way valves, 2-way valves, face-and-bypass dampers), constant vs. variable evaporator flow, chiller plant design concepts (parallel, series, and primary-secondary or decoupled), combined energy (hybrid) plants, low-flow systems, variable-primary-flow systems, heat recovery, sidecar arrangement, free cooling (plate-and-frame heat exchanger, refrigerant migration), and chilled-water system control (chiller sequencing, swing chiller, failure recovery, system optimization, and system-level control).	\$16.00
334290	TRG-TRC017-EN	HVAC System Control (2002)	Dual units (IP/SI)	Introduction to automatic control of HVAC equipment and systems. Topics include: control loops, types of control action (two position or on/off, floating, proportional, proportional-integral or PI, and proportional-integral-derivative or PID), pneumatic controls, analog-electric controls, microprocessor-based controls or DDC, unit-level control versus system-level control, example unit-level control loops for a VAV air handler (discharge-air temperature, ventilation, airside economizer, mixed-air temperature, static pressure, building pressurization), examples of system-level control (occupied versus unoccupied modes, morning warmup mode, changeover in a two-pipe system, water loop temperature control in a WSHP system), examples of system optimization strategies (fan-pressure optimization, optimum start, chilled-water reset, WSHP loop optimization), normally-open versus normally-closed actuators, common functions of a building automation system (responding to complaints, graphical user interface, time-of-day scheduling, centralized alarms and diagnostics, remote access, reports, preventive maintenance, integration with other systems, multiple-site support), network terminology, dedicated vs. shared networks, communication protocols, gateways, interoperability, BACnet, LonTalk, LonMark.	\$16.00

SIN	Order Number <u>[ORDER FORM on Web]</u>	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	TRG-TRC018-EN	Introduction to HVAC Systems (2004)	Dual units (IP/SI)	Introduction to HVAC systems that dissects the entire system into five subsystems, or "loops." Topics include: requirements for occupant comfort, five "loops" (airside loop, chilled-water loop, refrigeration-equipment loop, heat-rejection loop, controls loop), factors that affect decision to choose a chilled-water versus a direct expansion (DX) system, packaged versus split systems, common HVAC system types, single-zone versus multiple-zone systems, constant-volume versus variable-air-volume systems, packaged terminal air conditioner (PTAC), single-zone packaged DX rooftop, DX split system, chilled-water terminal system (fan coils, classroom unit ventilators, blower coils), two-pipe versus four-pipe systems, water-source heat pump systems, dedicated outdoor-air systems, single-zone VAV, multizone system, three-deck multizone system, changeover-bypass system, multiple-zone VAV system, rooftop VAV system, self-contained DX VAV system, chilled-water VAV system, double-duct VAV system, and factors that impact the selection of the HVAC system.	\$16.00
334290	TRG-TRC019-EN	Ice Storage Systems (2005)	Dual units (IP/SI)	This clinic focuses on glycol-based ice storage systems, which use an ice-chiller to cool a heat transfer fluid—often a mixture of water and antifreeze, such as glycol—to a temperature below the freezing point of water. This fluid is pumped through an ice storage tank, causing water inside the tank to freeze. Topics include: benefits of ice storage, on-peak versus off-peak, ice storage tank, full storage versus partial storage, ice-making chiller, heat transfer fluid, ethylene glycol versus propylene glycol, common system layouts (small versus large systems), retrofitting existing systems, control of ice storage systems (tactical control versus strategic control).	\$16.00
BUNDLED SETS					
334290	1-43.186	Set of all <i>Air Conditioning Clinic</i> booklets		Set of all <i>Air Conditioning Clinic</i> booklets	\$205.00
334290	1-43.165	"Air Conditioning Clinic" bundle		This bundle includes: - Set of all <i>Air Conditioning Clinic</i> booklets - Ductulator duct sizing calculator - Psychrometric Charts – pad of 25, standard altitude, I-P units	\$215.00
TEXTBOOKS AND MANUALS					
334290	AC MANUAL	Trane Air Conditioning Manual (1996)	IP units only	A comprehensive textbook, initially published in the 1930's, on the fundamentals of heating, ventilating, and air conditioning (HVAC). The audience is broad and has historically included students, HVAC system designers, installing contractors, architects, system operators, and service technicians. Chapters include: Heat and Its Measurement, Comfort; Heat Gains; Properties Of Air and The Psychrometric Chart; Calculations For The Conditioned Air Supply; Refrigeration Theory, Compressors, and Refrigeration Cycle Components; Refrigeration and Cooling Apparatus; Use Of Water In Air Conditioning; Air Transport Systems; The Air Conditioning System.	\$40.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
APPLICATION MANUALS					
<p>Purpose: Comprehensive reference guides to increase awareness and working knowledge of heating, ventilating, and air conditioning (HVAC) system design concepts, component combination possibilities, system operating/control concepts and characteristics, general industry issues, and HVAC fundamentals.</p> <p>Audience: The intended audience is HVAC system designers. However, depending on the topic, the manual may also be of interest to others in the industry. I-P units only (unless stated otherwise).</p> <p>Note: There are more application manuals that deal specifically with obsolete Trane products and control systems. If they do not appear on this list, these manuals can be found archived on Trane's Eagle™ product information system (search Literature Type = Application Manual). Contact your local Trane office, or e-mail bookstore@trane.com, for further information on Eagle.</p>					
334290	SYS-APM001-EN	Multiple Chiller System Design and Control (2009)	Dual units (IP/SI)	Details basic multiple-machine chilled water systems. Topics include: components of a chilled water system, chillers in parallel, chillers in series, primary/secondary (decoupled) systems, effects of temperatures and flow, low flow system designs, distributed pumping, tertiary pumping, chiller plant controls, chilled water reset, chiller staging, variable-primary flow (VPF) systems, heat recovery, free cooling, sidestream arrangement, system design considerations, preferential loading, alternate energy sources, series-counterflow arrangement, redundancy, contingency planning, condenser water systems, and cooling tower control.	\$16.00
334290	SYS-APM003-EN	Air-to-Air Energy Recovery in HVAC Systems (2008)	Dual units (IP/SI)	Discusses the various air-to-air energy recovery technologies and their application in HVAC systems. Topics include: why recover energy?, sensible- versus total-energy recovery, effectiveness, unbalanced airflow, outdoor-air preconditioning (or exhaust-air heat recovery), supply-air tempering (or reheat) in series or parallel, ASHRAE Standard 90.1, impact on first cost and operating cost, frost prevention methods, minimizing cross leakage, methods of capacity control, coil loops (or coil runaround loops), fixed-plate heat exchangers (or air-to-air heat exchangers), heat pipes, rotary heat exchangers (or heat wheels, enthalpy wheels, desiccant wheels), ARI Standard 1060, controlling energy recovery devices in dedicated outdoor-air systems and mixed-air systems (constant volume, VAV), economizer operation, active desiccant dehumidification systems, local versus centralized preconditioning.	\$16.00
334290	SYS-APM004-EN	Dehumidification in HVAC Systems (2002)	Dual units (IP/SI)	Discusses the dehumidification performance of various, cold-coil commercial HVAC systems, particularly at part-load conditions. Topics include: why control humidity in buildings, sources of moisture, cold coil versus active desiccant dehumidification, full-load versus part-load conditions, ASHRAE weather data, dehumidification performance of constant-volume systems (impact of climate, impact of outdoor-air quantity, impact of packaged direct expansion DX equipment, impact of energy recovery, fan-speed adjustment, mixed-air bypass, return-air bypass, dual path air handlers, supply-air tempering or reheat), dehumidification performance of VAV systems (impact of minimum airflow settings, impact of supply-air temperature reset, supply-air tempering at VAV terminals, using colder supply-air temperatures), dedicated outdoor-air systems (neutral versus cold, to the space versus to other units, design procedures, general application considerations (humidity control during unoccupied periods, building pressure control, airside economizer control), psychrometric analyses, ASHRAE Standards 62 and 90.1.	\$16.00
334290	SYS-APM005-EN	Waterside Heat Recovery in HVAC Systems (2003)	Dual units (IP/SI)	This manual focuses on waterside heat recovery. It describes concepts and mechanical implementation, and identifies system-level characteristics for effective operation and control. Topics include: why use heat recovery?, heat-recovery chiller types, system configurations and control modes, heat rejection control, common uses of recovered heat, and analysis methods.	\$16.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	SYS-APM007-EN	Rooftop VAV Systems (2012)	Dual units (IP/SI)	Discusses proper design and application of packaged rooftop, variable air volume (VAV) systems. Topics include: basic system operation, benefits and drawbacks of a rooftop VAV system, in-depth coverage of the components that make up the system (packaged rooftop unit, VAV terminal units, air distribution system, hot water heating system, controls), solutions to address common design challenges (zoning, ventilation, humidity control, energy efficiency, acoustics), several system variations (cold air distribution, single-zone VAV, air-to-air energy recovery), and common unit-level and system-level control functions (including system optimization strategies).	\$16.00
334290	SYS-APM008-EN	Chilled-Water VAV Systems (2012)		Discusses proper design and application of chilled-water, variable air volume (VAV) systems. Topics include: basic system operation, benefits and drawbacks of a chilled-water VAV system, in-depth coverage of the components that make up the system (VAV air-handling unit, VAV terminal units, air distribution system, chilled-water system, hot water heating system, controls), solutions to address common design challenges (zoning, ventilation, humidity control, energy efficiency, acoustics), several system variations (cold air distribution, single-zone VAV, air-to-air energy recovery, dual-duct VAV systems), and common unit-level and system-level control functions (including system optimization strategies).	\$16.00
334290	SYS-APM009-EN	Central Geothermal Systems (2011)		Discusses proper design and control of central geothermal bidirectional cascade systems that use borefields. Topics include system design considerations (borefield, ground water, water temperatures, chiller/heater selection, system piping, system design options (optimum efficiency design features, supplemental heat, auxiliary energy rejection, contingency cooling, chilled-water pump control), airside considerations (heating design, economizer control, freeze protection, ASHRAE Standard 90.1 compliance), system operation and control (heating only, cooling only and simultaneous heating and cooling).	\$20.00
334290	SYS-APM010-EN	Water-Source and Ground- Source Heat Pump Systems (2013)		Discusses proper design and application of water-source (WSHP) and ground-source heat pump (GSHP) systems. Topics include: basic system operation; benefits and drawbacks of a WSHP system; in-depth coverage of the components that make up the system (water-source heat pumps, water distribution system, heat rejection and heat addition, dedicated outdoor-air system); solutions to address common design challenges (thermal zoning, ventilation, humidity control, energy efficiency, acoustics); several system variations (ground-coupled, surface-water, and ground-water heat pump systems, as well as several hybrid system configurations); and common unit-level and system-level control functions (including system optimization strategies).	\$16.00
334290	ISS-APM001-EN	Acoustics in Air Conditioning (2006)	Dual units (IP/SI)	Discusses the fundamentals of sound to aid in the design of quiet HVAC systems. Topics include: definitions, frequency, octave bands, sound power vs. sound pressure, sound ratings (A-weighting, B-weighting, C-weighting, noise criteria - NC, room criteria - RC, sone, phone), sound measurement methods, equipment sound rating and industry standards (ARI, AMCA, ASHRAE), source-path-receiver, sound paths, attenuation, transmission loss, regenerated noise, room effect, and fan-generated noise.	\$16.00
334290	APP-APM001-EN	Refrigerating Systems and Machinery Rooms: ASHRAE Standard 15 (2012)	Dual units (IP/SI)	Details ASHRAE Standard 15-2010 as it relates to water-chiller refrigeration systems that require machinery (or mechanical or equipment) rooms. Topics include: ASHRAE Standard 34, refrigerants, refrigerant safety classifications, standards vs. guidelines, ASHRAE Standard 15, machinery room, ventilation for machinery rooms, pressure relief piping, refrigerant monitors, equipment room design specification, indirect open-spray systems, MER, SCBA, and ANSI Standards.	\$16.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	AM-SYS-6	Variable Air Volume Duct Design (1981)	IP Units only	Covers information pertaining to variable volume duct design with special attention given to the static regain method. Topics include: computerized duct design, round vs. rectangular ductwork, duct heat gain, fitting efficiency, duct design rules, typical duct layout errors, high-velocity duct fittings, and static pressure sensor location.	\$4.00
334290	SYS-AM-7	Water Source Heat Pump System Design (1994)	IP Units only	Describes the water source heat pump system, including design, selection, installation, and controls. Topics include: components, basic operation, system design, control recommendations, typical system operation parameters, boiler, cooling tower and pump selection, piping design recommendations, water regulating valve and variable speed pumping, hybrid systems, condensate drain lines, freeze protection.	\$16.00
334290	AM-SYS-9	Self- Contained/VAV System Design (1984)	IP Units only	Discusses the various aspects of self-contained/VAV system applications and to provide suggestions that will help the designer make the best possible design decisions when applying this equipment. Topics include: system components, VAV terminal unit types, equipment selection, zoning, interior vs. perimeter zones, cooling tower and condenser water pump and piping, freeze protection, system control, airside economizer, waterside economizer, building pressurization, system-level controls, and system optimization.	\$5.00
334290	SYS-AM-10	Ice Storage Systems (1987)	IP Units only	Intended to aid designers in the design of ice storage systems using ethylene glycol. Topics include: types of thermal storage (chilled water, ice, eutectic salts), full storage vs. partial storage, ice storage selection and capacity, chiller selection, ice storage system design and control. NOTE: See also the "Ice Storage Systems" series of Engineered Systems Clinics (ISS-CLC-1, 2, 3, 4).	\$5.00
334290	SYS-AM-13	Absorption Chiller System Design (1999)	Dual units (IP/SI)	Helps designers correctly apply absorption chillers into systems. Topics include: absorption refrigeration cycle, types of absorption chillers, gas cooling with absorption, economic analysis, chiller control, chiller plant design and control (heat recovery, thermal storage, heating applications), installation (exhaust stack, ASHRAE Standard 15, combustion air), and maintenance considerations.	\$16.00
334290	SYS-AM-15	Managing Building Moisture (2010)	IP Units only	This manual helps HVAC system designers identify and quantify moisture sources in buildings. It also presents moisture-management techniques related to the building envelope, the occupied space and the mechanical-equipment room. Topics include: indoor air quality (IAQ), comfort, moisture sources, condensation, building envelope, dehumidification, equipment room moisture, ventilation air, moisture and equipment, drain pans, condensate traps, insulation, infiltration, vapor-pressure diffusion, design and control strategies, humid climates, and humidity control.	\$16.00
334290	AM-CON-10	Hot Gas Bypass Control (1982)	IP Units only	Explains the hot gas bypass (HGBP) system by discussing what it is, why and when it should be used, how it is properly applied, and how to size/adjust a HGBP valve. Includes: hot gas bypass to evaporator inlet, hot gas bypass to suction line.	\$1.25
334290	AM-CON-17	Building Pressurization Control (1982)	IP Units only	Reviews several key definitions and outlines these space pressure control systems: natural relief, barometric relief, constant volume return fan, constant volume exhaust fan, powered barometric relief, coordinated exhaust/supply fan control, coordinated return/supply fan control, volume reset of return fan, direct pressurization control, and sequenced control of multiple exhaust fans. Points out system performance characteristics and suggests control applications. Includes a general discussion, design considerations, system alternatives, and recommended equipment for the application.	\$5.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	ICS-AM-4	Control of Ice Storage Systems (1988)	IP Units only	Reviews ice storage controls as a part of a Trane Integrated Comfort system. Topics include: operating modes, control sequence development, demand-limiting vs. time-of-use, data gathering and monitoring and ice inventory, control of system components (chiller, pump, blending valve, bypass valve), system control and monitoring, load profiles, ice inventory, and points lists.	\$5.00
334290	ED-FAN	Fans and Their Application in Air Conditioning (1982)	IP Units only	Provides a detailed overview of fan fundamentals intended to help system designers understand their performance, selection, application and control. Topics include: terminology, testing, fan performance curve, system resistance curve, fan surge, fan paralleling, types of fans (forward curved, backward inclined, radial, tubular, axial, fan laws, industry standards (AMCA), inlet and discharge conditions, transitions, drive and bearing losses, fan modulation devices (scroll volume damper, inlet and discharge dampers, inlet vanes, speed modulation, blade pitch variation), parallel and series operation, draw-thru vs. blow-thru, supply fans in systems, return fans, motors and controls, types of motor starters, power transmission, sound and vibration control, selection, specification, installation, maintenance, troubleshooting, and field measurement methods.	\$10.00

ENGINEERS NEWSLETTER LIVE DVDS

Purpose: Engineers Newsletter Live is a series of programs focused on the design and control of heating, ventilating, and air conditioning (HVAC) systems. The content of each program is objective, technical and educational in nature. The series is produced and presented by the Trane Applications Engineering team

Audience: The intended audience for these programs is HVAC system designers. However, depending on the topic, the program may also be of interest to others in the industry. Asterisks designate programs accredited for continuing education by American Institute of Architects (AIA) and United States Green Building Council (USGBC). Assessment is required for credit please visit www.trane.com/continuingeducation to submit the associated quiz for continuing education credit.

Length/Language/Units: Each program is 90 minutes long, in English, with I-P units displayed only.

334290	APP-CMC001-EN	The Low Dollar Chiller Plant (August, 1999)	IP Units only	Gain an understanding of low-flow chiller system designs that will result in reduced capital, energy, and installed costs. Topics include: low flow, cooling tower performance, chilled-water coil performance, chiller-tower optimization, series chillers, variable-primary-flow systems.	\$30.00
334290	APP-CMC002-EN	Specifying Quality Sound (March, 2000)	IP Units only	Provides an understanding of how product sound data is developed and how to performance optimize an air-handling unit. Topics include: space sound level targets (NC, RC), acoustical analysis, source-path-receiver method, ARI 260, cost effective noise control ideas (fan types, air handler casing, wall construction, return air path, silencers).	\$30.00
334290	APP-CMC003-EN	Lowering Supply Air Temperatures (May, 2000)	IP Units only	This program explores the impact on system first cost and operating costs when lower air temperature principles are applied using modern-day equipment and technologies. The common concerns associated with low-temperature air systems are discussed along with strategies to address these issues. Topics include: cold air, chilled-water coil performance, fan-powered VAV boxes, vapor retarder, building pressurization, diffuser selection.	\$30.00
334290	APP-CMC004-EN	Advanced System Control Strategies (June, 2000)	IP Units only	This program discusses key air-handling system control issues like building pressure control, system ventilation control, damper control, and various reset strategies. Advanced control ideas related to the impact of energy recovery within systems is also covered. All of these topics are discussed with an eye toward compliance with ASHRAE Standards 62 and 90.1, while maintaining comfort and minimizing system operating and life-cycle costs. Topics include: ventilation reset, dual versus single damper mixing boxes, fan-pressure optimization, optimized damper control, building pressurization control, control of air-to-air energy recovery (economizer, capacity modulation).	\$30.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	APP-CMC005-EN	Building Moisture and Humidity Management (August, 2000)	IP Units only	Provides a better understanding of the issue of building moisture control and the part-load dehumidification performance of various constant-volume system configurations. Other topics include: ASHRAE weather data, sensible- (peak dry bulb) and latent-design (peak dew point) conditions, psychrometric analysis (full load and part load), impact of total energy recovery, mixed-air bypass, return-air bypass, split dehumidification unit (SDU), supply air tempering (reheat), ASHRAE Standard 90.1.	\$30.00
334290	APP-CMC006-EN	Air-to-Air Energy Recovery (October, 2000)	IP Units only	Addresses the available energy-recovery technologies; how they are applied in various systems; whether or not the investment is worth the return; and what works best and why. Topics include: sensible- versus total-energy recovery, effectiveness, balanced versus unbalanced airflows, coil loops, heat pipes, fixed-plate heat exchangers, sensible wheels (heat wheels), total-energy wheels (enthalpy wheels), psychrometric analysis (cooling and heating), equipment downsizing, frost prevention, capacity modulation, VAV systems, constant-volume systems, dedicated outdoor-air systems (cold and neutral), control modes for all these systems, ASHRAE Standard 90.1.	\$30.00
334290	APP-CMC007-EN	Geothermal Heat Pump Systems (May, 2001)	IP Units only	By watching the program, viewers will understand the critical factors in the success of geothermal heat pump systems, consider the advantages and disadvantages, understand the economic considerations, and system variations. Topics include: conventional boiler-cooling tower WSHP system, geothermal heat pump system design process (site evaluation, loop sizing, life-cycle cost evaluation), types of geothermal heat exchangers (vertical, horizontal, spiral or slinky), surface water systems, ground temperatures, GLHEPRO loop design software, hybrid systems, ARI/ASHRAE/ISO Standard 13256-1, ASHRAE Standard 90.1.	\$30.00
334290	APP-CMC008-EN	Dedicated Outdoor-Air Systems (September 2001)	IP Units only	By watching the program, viewers will learn when separate conditioning of ventilation air is best applied; understand the pros and cons of dedicated outdoor-air ventilation systems in comparison to other system types; and understand the code requirements. Other topics include: system configurations (neutral-to-space, cold-to-space, neutral-to-units, cold-to-units), neutral versus cold air, system design procedures, system optimization ideas, application considerations (recovered heat for reheat, after-hours humidity control, building pressurization, economizer operation, outdoor-air preconditioning with air-to-air energy recovery) and ASHRAE Standard 90.1.	\$30.00
334290	APP-CMC009-EN	Split System Refrigerant Piping Design (December 2001)	IP Units only	A lower-cost and more reliable system is achieved by applying the "new rules" for sizing refrigerant lines with R-22 Trane scroll compressor split systems. The manufacturer should size the line whenever possible, but since some of the techniques presented in this program wouldn't have been considered good practice in the past, it's important to understand why. The purpose of this ENL is to learn how Trane has refocused the piping practices to achieve a less-costly and more reliable operating system; discover the traits of effective refrigerant piping; understand when to use the various line-sizing tools; and learn when and when not to use hot gas bypass.	\$30.00
334290	APP-CMC012-EN	Coil Fundamentals (February, 2002)	IP Units only	This ENL reviews the basic principles of heat transfer and how they're exploited in coil technology. Topics include: how chilled-water coil selections affect the entire system, how to properly apply DX coils in cooling applications, the advantages and disadvantages of face-split, row-split, and intertwined refrigerant coil arrangements, and how to avoid freeze-ups and operational problems in steam systems	\$30.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	APP-CMC013-EN	Commercial Building Pressurization (April, 2002)	IP Units only	This ENL reviews the basic principles of building pressure control in commercial buildings. Topics include: why control building pressure, (impact of overly positive or overly negative building pressure, what impacts building pressure? (intermittent local exhaust fan operation, airside economizer, stack effect, wind), natural relief, barometric relief (local in the space, or central at the unit), central relief fan (control options), central return fan (control options), and pressure sensor (indoor and outdoor) location and selection.	\$30.00
334290	APP-CMC014-EN	Underfloor Air Distribution (February, 2003)	IP Units only	This ENL program discusses the benefits and issues associated with underfloor air distribution (UFAD) systems and common system configurations. Topics include: potential benefits and potential problems, floor options, type of floor diffusers, types of terminal equipment, common system configurations, and control considerations (economizer, dehumidification, heating, plenum pressure control)	\$30.00
334290	APP-CMC015-EN	Variable-Primary-Flow Chilled-Water Systems (May, 2003)	IP Units only	This ENL program discusses variable-primary-flow (VPF) chilled-water systems. Topics include: comparison of a primary-secondary (decoupled) system to a variable-primary-flow system, advantages of VPF systems, proper selection of chillers for VPF applications, control sequence of operation, impact of VPF on plant design (series chillers, retrofit projects, manifolded or dedicated pumps, different type and size of chillers), and ASHRAE Standard 90.1 requirements.	\$30.00
334290	APP-CMC016-EN	High Performance Schools (October, 2003)	IP Units only	This program briefly reviews common attributes of High Performance School initiatives. Topics include: government initiatives, elements of High Performance School programs, indoor air quality, contaminant source control (location of outdoor air intakes), ventilation (calculating design ventilation rates, demand-controlled ventilation), building moisture control (moisture sources, methods for minimizing moisture problems), improving dehumidification performance of HVAC system (chilled-water terminal systems, single-zone DX systems, central VAV air-handling systems), acoustics in classrooms (ANSI/ASI Standard 12.60, reverberation time, absorption, background sound), lowering background sound of HVAC system (acoustical analysis, attenuation options), challenges of financing educational priorities (capital versus operating budgets, potential sources of funding, life-cycle cost analysis).	\$30.00
334290	APP-CMC017-EN	HVAC and LEED (February, 2004)	IP Units only	This program provides an overview of the U.S. Green Building Council's "Leadership in Energy and Environmental Design" (LEED) Green Building Rating System, with specific focus placed on how it relates to HVAC systems.	\$30.00
334290	APP-CMC018-EN	Improving Dehumidification in Restaurants and Retail Stores (May, 2004)	IP Units only	This program discusses why humidity control is important for restaurants and retail stores (dry goods and wet goods), demonstrates how the constant-volume direct expansion (DX) equipment that is commonly used in these building types may not dehumidify adequately at part load, proposes some system designs that can offer enhanced humidity control, and discusses how ventilation requirements affect system design.	\$30.00
334290	APP-CMC019-EN	Small Chilled-Water Systems – Design and Application (September, 2004)	IP Units only	This program discusses which small-capacity applications favor chilled water, and explains how to simplify the design, control, and operation of small chilled-water systems. For the purpose of this program, a "small" chilled-water system is less than 120 tons in capacity, and contains one or two air-cooled chillers.	\$30.00
334290	APP-CMC020-EN	Cooling Towers and Condenser-Water Systems – Design and Operation (January, 2005)	IP Units only	Proper design of a chilled water system can greatly affect its energy use and life-cycle costs. Fine-tuning the design and operation can go a long way toward minimizing energy costs—but it also requires a good understanding of how the system components affect each other. This ENL examines cooling tower–chiller interaction at various conditions, and discusses techniques to minimize initial and/or operating costs.	\$30.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	APP-CMC022-EN	Energy Analysis – LEED™ Modeling (May, 2005)	IP Units only	Energy models are a critical requirement in the U.S. Green Building Council's LEED-NC rating system. Under Energy & Atmosphere (EA) Credit 1, a prospective LEED building can earn up to 10 points if the project team can demonstrate optimized energy performance. The greater the reduction in energy cost, the more points may be awarded. This program will discuss methods of building design and operation to reduce energy costs (including daylighting, HVAC design parameters, and control options) and how to earn EA Credit 1 points by effectively modeling energy-saving designs.	\$30.00
334290	APP-CMC023-EN	ASHRAE Standard 62.1-2004: Ventilation Requirements (September, 2005)	IP Units only	In the 2004 version of ASHRAE Standard 62.1, the entire Ventilation Rate Procedure (VRP) has been revamped. This procedure is used to determine the minimum ventilation requirements for commercial, institutional, and high-rise residential buildings. The new VRP changes the requirements for breathing-zone and system-intake ventilation airflow by better accounting for the "additivity" of contaminants from different sources (people vs. building). It also details system ventilation efficiency for multiple-zone systems. This ENL takes a detailed look at the design and operation of various ventilation systems and their compliance with the new requirements.	\$30.00
334290	APP-CMC024-EN	CO2-Based Demand-Controlled Ventilation (November, 2005)	IP Units only	The mobility of a building's occupants poses a ventilation challenge...to bring enough outdoor air into the building to help assure good indoor air quality without wasting energy by bringing in (and conditioning) too much. This ENL discusses the use of carbon-dioxide (CO2) sensors to vary outdoor airflow based on actual demand. It also considers the related requirements for compliance with ASHRAE Standard 62.1-2004.	\$30.00
334290	APP-CMC025-EN	Variable-Speed Drives and Their Effect on HVAC System Components (February, 2006)	IP Units only	Variable-speed drives (VSDs) can save energy, but the savings may not equal "the cube of the speed" in every case. This ENL looks at how VSDs affect the performance of pumps, cooling-tower fans, air-handler fans, and chillers, and discusses the differences in VSD control in each of these applications	\$30.00
334290	APP-CMC026-EN	HVAC Systems and Airside Economizers (May, 2006)	IP Units only	Airside economizers can lower annual energy costs by using outdoor air to help satisfy the building cooling load. This ENL discusses their use and control in constant- and variable-volume airside systems. It also considers the implications of the energy-use requirements in ASHRAE Standard 90.1 for airside economizing.	\$30.00
334290	APP-CMC027-EN	HVAC Design for Places of Assembly (September, 2006)	IP Units only	Places of assembly such as auditoriums, gymnasiums and houses of worship create design and operational challenges for HVAC systems. Loads and ventilation requirements due to the number of people in the space are a challenge for any HVAC system. However, these issues can be overcome with proper system knowledge, design and operation.	\$30.00
334290	APP-CMC028-EN	Energy-Saving Strategies for Rooftop VAV Systems* (November, 2006)	IP Units only	Rooftop variable-air-volume (VAV) systems are used to provide comfort in a wide range of building types and climates. This ENL discusses HVAC system design and operating strategies that can save energy in these systems. Topics include: high efficiency equipment, air-to-air energy recovery, relief fan vs. return fan, evaporative condensing, hot gas bypass, hot gas reheat, maintenance program, fan-powered VAV, single-zone VAV, airside economizer, fan-pressure optimization, optimum start, optimum stop, supply-air-temperature reset, ventilation optimization (demand-controlled ventilation, ventilation reset), TRACE 700.	\$30.00
334290	APP-CMC029-EN	Waterside Heat Recovery (February, 2007)	IP Units only	Green building initiatives, coupled with changes in building codes and standards, have renewed interest in applications that recover condenser heat from water-cooled chillers. This ENL describes how waterside energy recovery works, what is necessary for implementation, and identifies system-level characteristics for effective operation and control	\$30.00

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334290	APP-CMC030-EN	Improving Dehumidification in HVAC Systems (September, 2007)	IP Units only	Managing humidity should be a key design consideration in any HVAC application. This ENL will discuss the challenge of dehumidifying at part load, for both chilled-water and cycling compressor systems, and describe ways to improve the dehumidification performance of commonly-used HVAC systems. Topics include: modulating chilled water coil, cycling compressors, impact of ventilation, impact of oversizing, total-energy recovery, cool-reheat (hot gas reheat, condenser water heat recovery), face-and-bypass dampers (mixed-air bypass, return-air bypass), reduce airflow (multi-speed fan, VAV, single-zone VAV), dual paths (dedicated outdoor-air system, split dehumidification unit or SDU), desiccants (CDQ), and TRACE 700 humidity modeling and reports.	\$30.00
334290	APP-CMC031-EN	LEED® Case Studies (November, 2007)	IP Units only	As of the program date, the number of LEED certified buildings stands at over 800, with more than 6,500 additional buildings in the pipeline for certification. With USGBC's aggressive goal of having 100,000 certified buildings by 2010 there is no doubt this will be a major impact on the built environment. Sustainable design, construction, and operation will be increasingly requested by building owners. This ENL will provide an in-depth review of LEED certified projects in a variety of building types and geographic locations. Unlike the previous LEED-related programs, this ENL provides interviews with various project stakeholders to review LEED credits that were obtained for each project, the original design intent, challenges and lessons learned.	\$30.00
334290	APP-CMC032-EN	Energy-Saving Strategies for LEED® and the Energy Policy Act* (May, 2008)	IP Units only	According to the U.S. Green Building Council (USGBC), buildings account for 36 percent of the energy used in the United States. This ENL program discusses energy-saving strategies to implement for various HVAC system types, and quantifies the impact of each toward achieving LEED points under the "Optimize Energy Performance" credit. It includes a detailed review of an energy modeling study conducted to demonstrate the potential energy cost savings (for various strategies, climate zones, and HVAC system types) for achieving LEED points and demonstrates how these same strategies can help the building owner qualify for tax deductions through the Energy Policy Act. The presentation provides design engineers with a better understanding of the "big picture" of building energy use, including the impact of the building envelope, lighting, plug loads, and processes and covers common mistakes made when modeling for LEED points.	\$30.00
334290	APP-CMC033-EN	Small Chilled-Water Systems – Part II (September, 2008)	IP Units only	More than 80 percent of new buildings in the U.S. are less than 25,000 square feet and almost all buildings are less than 200,000 square feet. This program identifies challenges and opportunities for chilled-water systems in these buildings from 20 to 500 tons. In addition, many low-rise buildings seeking LEED certification have traditionally not been strong candidates for chilled-water systems. If they are 150,000 square feet or less, their baseline for achieving LEED points under EAc1 will not be a chilled-water system. However, these applications may find it easier to beat their baseline and earn more points if they consider a chilled-water system.	\$30.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	APP-CMC034-EN	ASHRAE Standards 62.1 and 90.1, and VAV Systems* (November, 2008)	IP Units only	Many designers want to comply with both Standard 62.1 and Standard 90.1. Requirements from both standards have been incorporated into many building codes, and the minimum requirements of both standards must be met as prerequisites to LEED certification. In attempting to comply with the ventilation requirements of Standard 62.1 AND the energy-limiting requirements of Standard 90.1, some designers have concluded that it's next to impossible to do so using traditional VAV systems. While in some specific cases these designers might be right, in most cases they are not right. In this program, the immediate past Chair of SSPC 62.1 (Dennis Stanke), the immediate past Chair of SSPC 90.1 (Mick Schwedler), and the one of the authors of the VAV-related sections in the User Manuals for both standards (Steve Taylor), discuss the potentially conflicting requirements and design choices	\$30.00
334290	APP-CMC035-EN	LEED® 2009 Modeling and Energy Analysis* (March, 2009)	IP Units only	USGBC's LEED 2009 green building certification program was released in January this year. This presentation will cover the major changes in LEED 2009 and how they impact the HVAC practitioner. Chair of SSPC 90.1, Mick Schwedler, Scott Hintz of the Trane CDS support group and Chris Hsieh cover new regional credits, re-weighting of credit points, changes to the LEED AP credentialing and maintenance program, new modeling features that can help gain LEED points and much more.	\$30.00
334290	APP-CMC036-EN	Ice Storage System Design and Application* (May, 2009)	IP Units only	Thermal storage, specifically ice storage, is not only an easy way to store energy but it is reemerging as a valuable energy and energy cost saving technology for building owners. This presentation provides a bit of theory and application, then demonstrates the design steps for a small ice storage system from layout to operation and control. Presenters discuss how to make it affordable, expose hidden costs that may raise ROI, and identify and address the most common stumbling blocks.	\$30.00
334290	APP-CMC037-EN	Air-Handling Systems, Energy, and IAQ* (November, 2009)	IP Units only	Air-handling systems are key elements for building comfort and air quality, but they use energy. How much energy? The answer depends on system configuration and control strategies. This program presents various design and control strategies that can help reduce energy use, along with some interesting new technologies for improving indoor air quality (IAQ).	\$30.00
334290	APP-CMC038-EN	Fans In Air-Handling Systems* (March 2010)	IP Units only	Fans used in air-handling systems often have significant impact on energy use and acoustics. How much of an impact depends on how a fan is selected, installed and operated. Presentation covers fan performance curves and fan laws, different fan types (fan blade shape, housed vs. plenum fans, direct-drive plenum fans, fan arrays), how a fan interacts with various types of systems, considerations when selecting a fan (efficiency, acoustics, footprint) and ASHRAE Standard 90.1 fan power limitations. The discussion will help you determine the best fan selection based on the requirements of your specific application.	\$30.00
334290	APP-CMC039-EN	Central Geothermal Systems* (May 2010)	IP Units only	Most designers are familiar with heat pump systems, using small, "geothermal" heat pumps, distributed throughout the building, that are coupled with a ground source heat exchanger. Project teams are also considering central geothermal systems consisting of one or two chillers coupled with a closed, geothermal loop which exchanges heat with the earth. These systems offer premium energy efficiency, with the additional benefit of centralized maintenance, acoustic advantages, and flexibility.	\$30.00

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334290	APP-CMC040-EN	ASHRAE Standard 90.1-2010* (October 2010)	IP Units only	ASHRAE Standard 90.1-2010 was published in November 2010 with an aggressive goal of 30 percent energy-cost savings over the 2004 version of the standard. Trane experts on the 90.1 committee share their insights on the new requirements and implementation. This program discusses the major change with specific emphasis on mechanical-related system design, control and modeling, mechanical updates, including equipment efficiencies, design requirements for waterside, airside and ventilation, control updates for system design and operation, modeling changes for Appendix G baseline definitions and proposed buildings and summaries for lighting, envelope and other changes.	\$30.00
334290	APP-CMC041-EN	Upgrading Existing Chilled-Water Systems (March 2011)	IP Units only	Existing chilled-water systems provide the capability to cool buildings efficiently. Yet there are often ways that these existing systems can be upgraded and improved to increase efficiency and better serve building occupants. In this presentation we discuss chiller retrofits and replacement; explore different design parameters (flow rates and temperatures) and the opportunities they offer existing systems; examine use of variable flow in existing systems; and consider controls to optimize and reduce system energy use	\$30.00
334290	APP-CMC042-EN	High Performance VAV Systems (June 2011)	IP Units only	Variable-air-volume (VAV) systems have been used to provide comfort in a wide range of building types and climates. This ENL will discuss design and control strategies that can significantly reduce energy use and ensure proper ventilation in VAV systems. Topics include: ventilation system design and control, optimized VAV system controls, cold air distribution, other energy-saving strategies, and dehumidification enhancements.	\$30.00
334290	APP-CMC043-EN	Dedicated Outdoor-Air Equipment (October 2011)	IP Units only	Previous ENLs have discussed system design and control considerations for dedicated outdoor-air systems. This ENL will shift the discussion to the various types of equipment used for dedicated OA conditioning, from packaged DX units to split DX systems to air handlers and water chillers.	\$30.00
334290	APP-CMC044-EN	High-Performance Green Buildings: ASHRAE Standard 189.1-2011 (March 2012)	IP Units only	More and more building owners and municipalities want a standard for buildings which exceed minimum building codes. ASHRAE Standard 189.1-2011 Design of High-Performance Green Buildings addresses this demand. It's a mandatory-language code-intended standard with provisions related to building sites, water use, energy efficiency, general environmental impact, and indoor environmental quality. This ENL presents an overview of the standard and provides some insight regarding its potential impact on future building codes and building designs.	\$30.00
334290	APP-CMC045-EN	Energy-Saving Strategies for Water-source and Ground-source Heat Pump Systems (June 2012)	IP Units only	This ENL discusses HVAC system design and control strategies that can save energy in water-source heat pump (WSHP) and ground-source heat pump (GSHP) systems. Topics include the latest technologies being used in heat pumps, design and control of the water distribution loop and dedicated outdoor-air system, ground-source systems, and a review of the requirements in ASHRAE Standard 90.1 that apply to WSHP/GSHP systems.	\$30.00
334290	APP-CMC046-EN	Air-to-Air Energy Recovery (October 2012)	IP Units only	With the increased focus on reducing energy use in buildings, more projects are considering the use of air-to-air energy recovery. And energy codes are evolving to require energy recovery in more applications. This ENL will discuss the various technologies used for air-to-air energy recovery and the importance of properly controlling these devices in various systems types.	\$30.00
334290	APP-CMC047-EN	ASHRAE Standard 62.1-2010 (February 2013)	IP Units only	The 2010 version of ASHRAE Standard 62.1 will likely be the basis for the next version of the International Mechanical Code, and it is expected to be a prerequisite for version 4 of the LEED Green Building Rating System. This ENL provides an update of the 2010 version of the standard, and focus on the Ventilation Rate Procedure for calculating zone and system ventilation airflows.	\$30.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	APP-CMC048-EN	Single-Zone VAV Systems (April 2013)	IP Units only	Recent changes to ASHRAE Standard 90.1 require single-zone VAV systems in some applications. This ENL reviews these new requirements, discusses the benefits of single-zone VAV systems (energy savings, better part-load dehumidification, and lower part-load sound levels), identifies common applications for this system, and discusses ways to address application-related challenges (air distribution, demand-controlled ventilation, and building pressure control). In addition, we review a case study of a retrofit project where a constant-volume rooftop unit was replaced with a single-zone VAV unit.	\$30.00
334290	APP-CMC049-EN	All-Variable-Speed Chilled-Water Plants (October 2013)	IP Units only	Variable frequency drives (VFDs) are being used on all chilled-water system components (fans, pumps, and chillers), and for good reason. When systems are properly designed and controlled, they offer the opportunity for significant energy savings as well as improved operation. With these new opportunities come new complexities. This ENL discusses all-variable-speed chilled-water system design and control. Discussion will include individual component and system performance as well as system design options and control.	\$30.00
334290	APP-CMC050-EN	LEED v4 (March 2014)	IP Units only	LEED continues to thrive with more than 1.6 million square feet of space certified every day. In this ENL, Trane applications engineers will discuss changes in the latest version of LEED and how they impact HVAC practitioners.	\$30.00
334290	APP-CMC051-EN	Applying Variable Refrigerant Flow (May 2014)	IP Units only	This program discusses some of the challenges of applying a variable refrigerant flow (VRF) system, such as complying with ASHRAE Standards 15 and 90.1, meeting the ventilation requirements of ASHRAE Standard 62.1, and zoning to maximize the benefit of heat recovery. In addition, we review the current state of modeling VRF in energy simulation software.	\$30.00
334290	APP-CMC052-EN	Chilled Water Terminal Systems (Oct 2014)	IP Units only	Trane applications engineers discuss system design and control strategies for various types of chilled-water terminal systems, including fan-coils, chilled beams, and radiant cooling. Topics include: types of terminal equipment, variable-speed terminal fan operation, dedicated OA system design, chilled-water system design, and complying with ASHRAE 90.1 requirements	\$30.00
334290	APP-CMC053-EN	Variable-Speed Compressors On Chillers (Mar 2015)	IP Units only	Trane applications engineers discuss the operational, performance and application differences for centrifugal (dynamic compression) and helical-rotary (positive displacement) compressors. Discussion includes an overview of how variable-speed drives affect chilled-water system components, physics of centrifugal compressor chillers and screw compressor chillers, applications that benefit from each technology, importance of proper life-cycle analysis and application considerations to leave the viewer with an understanding of which technologies bring real value to different system applications.	\$30.00
334290	APP-CMC054-EN	Coils Selection and Optimization (May 2015)	IP Units only	Trane engineers discuss the application, selection, and optimization of both chilled-water and hot-water coils. Topics include a discussion about the impact of both water and air velocities on coil performance, a review of example selections for chilled-water and hot-water coils to demonstrate the tradeoffs of cost, pressure drop, and capacity, and an overview of various methods to prevent water coils from freezing during cold weather.	\$30.00
334290	APP-CMC055-EN	Evaluating Sound Data (May 2015)	IP Units only	Sound data is the foundation of acoustical analysis and it is often used for comparing equipment from different manufacturers. Unfortunately not all manufacturers present sound data in the same format. In this ENL, Trane Applications Engineers focus on clarifying sound data terms and weighting methods so that the differences in sound data presentation are apparent. Examples of the common mistakes made when comparing chillers, air-handlers, VAV units, and fan coils are discussed.	\$30.00

SIN	Order Number [ORDER FORM on Web]	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	APP-CMC056-EN	Chilled-Water System Design Trends (October 2015)	IP Units only	Improved technology and controls for chilled-water systems over the past several years enable these types of systems to do more and save more. This ENL reviews recent advancements in technology and trends due to these developments, system strategies that can take advantage of the latest technology and when various system strategies should be used. Consideration will be given to: variable primary, primary secondary, constant flow, series chillers, chilled water reset, pump pressure optimization, flow rates and turndown, heat exchanger types, and the components of air- and water-cooled systems.	\$30.00
HVAC SYSTEM DESIGN TOOLS					
334290	94.24	Ductulator® (1998)	Dual units (IP/SI)	Hand held rotating calculator used for sizing supply and return duct systems using the equal friction design method. Includes scales for friction loss per unit length, air volume, air velocity, round duct diameter, and rectangular duct diameters. One side uses I-P units, the other side uses SI units. Includes a protective sleeve with ASHRAE recommended design air velocities for system components/applications.	\$10.00
334290	1-43.190	Psychrometric Chart (1983) - standard altitude (29.921 in. Hg) - 11" x 17" pad of 25 sheets - Includes "coil curves"	I-P Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$7.50
334290	1-43.191	Psychrometric Chart (1983) - standard altitude (29.921 in. Hg) - (1) 11" x 17" laminated chart - Includes "coil curves"	I-P Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$15.00
334290	1-43.192	Psychrometric Chart (1983) - standard altitude (29.921 in. Hg) - 11" x 17" pad of 25 sheets - Includes "coil curves"	I-P Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$5.00
334290	1-43.195	Psychrometric Chart (1983) - high altitude (24 in. Hg) - 8.5" x 11" pad of 25 sheets - Includes "coil curves"	I-P Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$5.00
334290	1-43.196	Psychrometric Chart (1983) - standard altitude (101 kPa) - 11" x 17" pad of 25 sheets - Includes "coil curves"	SI Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$7.50

SIN	Order Number <u>[ORDER FORM on Web]</u>	Title (Publication Date)	IP or DUAL Units	Abstract	GSA Price
334290	1-43.197	Psychrometric Chart (1983) - standard altitude (101 kPa) - (1) 11" x 17" laminated chart	SI Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$15.00
334290	OSA 214 E	Psychrometric Chart (1996) - standard altitude (101 kPa) - 8.5" x 11" pad of 25 sheets - SI units - Includes "coil curves"	SI Units	Chart used for determining properties of moist air and analyzing air conditioning processes.	\$7.50
334290	1-43.198	Equilibrium Chart for Lithium Bromide Solutions (1983) - (1) 11" x 17" laminated chart	I-P Units	Chart used for determining properties of a lithium bromide solution used in the absorption refrigeration cycle.	\$15.00



Trane U.S. Inc.
 Authorized Government Price List
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GSA Pricing of Labor

SIN	Ref #	Trane Position Title	Service Contract Labor Standards	Description	GSA Price			
					West	Central	Northeast	Southeast
334290, 238910, ANCILLARY, 561210FAC, 541690E	S020	HVAC Field Technician	Non-Exempt	<p>Functional Description: Responsible for retrofit and repair of environmental-comfort systems, utilizing knowledge of air conditioning theory, pipe fitting, and mechanical layouts.</p> <p>Minimum Experience: Typically requires 5 years of related experience.</p> <p>Minimum Education: Associate's degree or equivalent from a Technical/Trade School with a certificate in Heating, Ventilation, and Air Conditioning and five (5) years related experience; or seven (7) years related experience; or equivalent combination of education and experience.</p>	\$159.24	\$194.16	\$193.68	\$149.04
334290, 238910, ANCILLARY, 561210FAC, 541690E	S021	HVAC Field Technical – Apprentice	Non-Exempt	<p>Functional Description: Assists HVAC Field Technicians in the installation and repair of environmental control systems, utilizing knowledge of refrigeration theory, control systems, pipe fitting, and structural layouts.</p> <p>Minimum Experience: Typically requires 6 months of related experience.</p> <p>Minimum Education: Associate's degree or equivalent from two-year college or technical school with a certificate in Heating, Ventilation, and Air Conditioning; or six months to one-year related experience and/or training; or equivalent combination of education and experience.</p>	\$138.28	\$167.24	\$154.11	\$137.47
334290, 238910, ANCILLARY, 561210FAC, 541690E	S022	HVAC Field Technician – Team Leader	Non-Exempt	<p>Functional Description: Performs and directs HVAC Field Technicians who accomplish the repair/retrofit/replacement installation of environment comfort systems, utilizing knowledge of air conditioning theory, pipe fitting and mechanical layouts.</p> <p>Minimum Experience: Typically requires 5 years of related experience.</p> <p>Minimum Education: Associate's degree or equivalent from two-year college or technical school with a certificate in Heating, Ventilation, and Air Conditioning; and five (5) years HVAC experience, or equivalent combination of education and experience. Must have knowledge of various HVAC products, systems, electronics, and pneumatic controls.</p>	\$199.56	\$203.49	\$226.77	\$178.81
334290, 238910, ANCILLARY, 561210FAC, 541690E	S049	HVAC Field Technician – Senior	Non-Exempt	<p>Functional Description: Applies training, knowledge and experience of HVAC systems at a Journeyman level HVAC Service Technician. Performs all work in the service and maintenance field on all major types of equipment, and is responsible for retrofit and repair of environmental-comfort systems, utilizing knowledge of air conditioning theory, pipe fitting, and mechanical layouts.</p> <p>Minimum Experience: Typically requires 7 years of related experience.</p> <p>Minimum Education: Associate's degree (A.A.) or equivalent from a technical / trade school with a certificate in Heating, Ventilation, and Air Conditioning and seven (7) years related experience; or ten (1) years related experience; or equivalent combination of education and experience.</p>	\$183.31	\$196.78	\$202.10	\$164.24



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GSA Pricing of Labor

SIN	Ref #	Trane Position Title	Service Contract Labor Standards	Description	GSA Price			
					West	Central	Northeast	Southeast
334290, 238910, ANCILLARY, 561210FAC, 541690E	S118	Project Administrator – Service	Non-Exempt	<p>Functional Description: Possesses project documentation, materials, job costing, status monitoring, invoicing, and administrative closeout of a service project. This position is required to closely interact with the Project Manager and assigned project staff to ensure the timely completion of services scope of work.</p> <p>Minimum Experience: Typically requires 6 months of related experience.</p> <p>Minimum Education: One-year certificate from college or technical school; or six (6) months to two (2) years or related experience and/or training; or equivalent combination of education and experience. Familiarity with the operation of Energy Management Systems, HVAC Systems, and/or Temperature Controls preferred.</p>	\$133.31	\$130.50	\$125.45	\$124.19
334290, 238910, ANCILLARY, 561210FAC, 541690E	S154	Service Helper	Non-Exempt	<p>Functional Description: Assists HVAC Field Technicians in routine maintenance and inspections on existing systems.</p> <p>Minimum Experience: Typically requires 1 year of related experience involving building trades or operation and service to buildings or HVAC.</p> <p>Minimum Education: High School Diploma or GED.</p>	\$135.62	\$135.69	\$140.71	\$139.74
334290, 238910, ANCILLARY, 561210FAC, 541690E	S082	Project Engineer II – Controls	Exempt	<p>Functional Description: Performs hardware and software design activities for building automation systems. Applies engineering principles and practices for work on assigned projects. Designs cost effective control solutions to meet project requirements. Works directly on the project team to assist the Project Manager with project commissioning.</p> <p>Minimum Experience: Typically requires 3-6 years of related experience.</p> <p>Minimum Education: Bachelor's degree in Engineering and 3-4 years experience; or Associate's degree or equivalent from two-year college or technical school in electrical engineering and a certificate in HVAC or AAS and BAS in electrical engineering and 5-6 years related experience; or equivalent combination of education and experience.</p>	\$285.03	\$177.51	\$177.85	\$203.56
334290, 238910, ANCILLARY, 561210FAC, 541690E	S083	Project Engineer II – Energy	Exempt	<p>Functional Description: Performs technical analysis, review, measurement, and verification of financially guaranteed projects. Provides technical analysis and review for performance monitoring or contracts, and applies engineering principles and practices on assigned projects.</p> <p>Minimum Experience: Typically requires 3 years of related experience.</p> <p>Minimum Education: Bachelor's degree in Engineering and three (3) years experience; or equivalent combination of education and experience. Knowledge and experience with HVAC, control, electrical systems and proficiency with energy analysis tools such as TRACE and system analyzer. Working knowledge of cost and savings studies incorporating energy conservation measures.</p>	\$288.70	\$209.78	\$247.69	\$204.14



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GSA Pricing of Labor

SIN	Ref#	Trane Position Title	Service Contract Labor Standards	Description	GSA Price			
					West	Central	Northeast	Southeast
334290, 238910, ANCILLARY, 561210FAC, 541690E	S084	Project Engineer II – Systems	Exempt	<p>Functional Description: Performs complex planning, estimating and design activities for the layout of equipment, commercial and industrial facilities. Determines the scope of projects, estimates cost, designs and documents HVAC and electrical systems and procures components. Works directly on the project team to assist the Project Manager with project commissioning.</p> <p>Minimum Experience: Typically requires 3-6 years of related experience.</p> <p>Minimum Education: Bachelor's degree in Engineering and 3-4 years related experience; or Associate's degree (A.A.) or equivalent from two-year college or technical school in electrical engineering and a certificate in HVAC or AAS and BAS in electrical engineering and 5-6 years related experience; or equivalent combination of education and experience.</p>	\$288.70	\$213.49	\$247.69	\$204.14
334290, 238910, ANCILLARY, 561210FAC, 541690E	S085	Project Manager – Controls	Exempt	<p>Functional Description: Manages all aspects of HVAC control projects, from beginning to end, with direct responsibility for project execution while leading a team, or teams, to accomplish specific objectives in a given time frame and with available resources. Responsible for the administration, implementation, and management of HVAC control projects. Ensures assigned projects' scope of work, schedule, and budget are achieved.</p> <p>Minimum Experience: Typically requires 2-6 years of related experience.</p> <p>Minimum Education: Bachelor's degree in Electrical or Mechanical Engineering or Construction Management with a minimum of two (2) years of project management, controls, HVAC or related experience, or a minimum of six (6) years of project management, controls, HVAC or related experience; or an equivalent combination of education and experience.</p>	\$230.98	\$217.40	\$197.41	\$202.44
334290, 238910, ANCILLARY, 561210FAC, 541690E	S089	Project Manager – Contracts	Exempt	<p>Functional Description: Manages all aspects of HVAC contract projects, from beginning to end, with direct responsibility for project execution while leading a team, or teams, to accomplish specific objectives in a given time frame and with available resources. Responsible for the administration, implementation, and management of control projects. Accountable for assigned projects' scope of work, schedule, and budget.</p> <p>Minimum Experience: Typically requires 2-6 years of related experience.</p> <p>Minimum Education: Bachelor's degree in Electrical or Mechanical Engineering or Construction Management with a minimum of two (2) years of project management, HVAC (systems, equipment, installation or service) or related experience, or a minimum of six (6) years or project management, HVAC (systems, equipment, installation, or service) or related experience; or an equivalent combination of education and experience.</p>	\$246.76	\$205.33	\$215.73	\$203.08



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GSA Pricing of Labor

SIN	Ref#	Trane Position Title	Service Contract Labor Standards	Description	GSA Price			
					West	Central	Northeast	Southeast
334290, 238910, ANCILLARY, 561210FAC, 541690E	S104	Project Engineer Team Leader	Exempt	<p>Functional Description: Performs hardware and software design activities for building automation systems. Applies engineering principles and practices for work on assigned projects. Designs cost effective control solutions to meet project requirements. Works directly with the project team to assist with project commissioning. Directs and assists other project engineers on the team related to opportunities and obstacles in managing the engineering workload. Possesses a familiarity with the concepts of new construction, renovation/retrofit; performance contracting, and service project management.</p> <p>Minimum Experience: Typically requires 2-4 years of related experience.</p> <p>Minimum Education: Bachelor's degree in engineering and two (2) to three (3) years experience; or Associate's degree or equivalent from two-year college or technical school in electrical engineering and a certificate in HVAC or AAS and BAS in electrical engineering and three (3) to four (4) years related experience; or equivalent combination of education and experience.</p>	\$288.70	\$217.12	\$247.69	\$204.14
334290, 238910, ANCILLARY, 561210FAC, 541690E	S119	Project Administrator – Contracting	Non-Exempt	<p>Functional Description: Responsible for project set-up, document control, data entry, billing, contract monitoring, and administrative closeout of each project. This position is required to closely interact with the Project Manager and assigned project staff to assist with the timely completion of each project.</p> <p>Minimum Experience: Typically requires 6 months of related experience.</p> <p>Minimum Education: One-year certificate from college or technical school; or six (6) months of related experience and/or training; or equivalent combination of education and experience. Familiarity with the operation of Energy Management Systems, HVAC Systems and/or Temperature Controls preferred.</p>	\$127.32	\$137.77	\$155.48	\$138.25
334290, 238910, ANCILLARY, 561210FAC, 541690E	S120	Computer Aided Drafter	Non-Exempt	<p>Functional Description: Responsible for creating computer aided design (CAD) drawings using standard CAD digitizing techniques and skills. Also responsible for the system graphics required to support automation systems design.</p> <p>Minimum Experience: Typically requires 6 months of related experience.</p> <p>Minimum Education: Associate's degree from college or technical school in Computer-Aided Design or Drafting; or at least six (6) months related experience and/or training; or equivalent combination of education and experience. Working knowledge of AutoCAD or other computer aided design, Microsoft Office software required.</p>	\$136.64	\$113.15	\$131.75	\$110.11
334290, 238910, ANCILLARY, 561210FAC, 541690E	S121	Controls Technician	Non-Exempt	<p>Functional Description: Performs more complex commissioning, diagnosis, and repair of environmental-control systems, utilizing knowledge of electronics, direct digital control, airflow, hydronics, refrigeration theory, and control techniques.</p> <p>Minimum Experience: Typically requires 6 months of related experience.</p> <p>Minimum Education: Associate's degree or equivalent from two-year college or technical school or six (6) months experience in control systems; or equivalent combination of education and experience.</p>	\$178.91	\$165.58	\$194.16	\$171.23



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SIN	Ref#	Trane Position Title	Service Contract Labor Standards	Description	GSA Price			
					West	Central	Northeast	Southeast
334290, 238910, ANCILLARY, 561210FAC, 541690E	S152	Controls Technician – Entry Level	Non-Exempt	Functional Description: Performs and assists under direction complex commissioning, diagnosis, and repair of environmental-control systems, utilizing knowledge of electronics, direct digital control, airflow, hydronics, refrigeration theory, and control techniques. Performs these tasks on simple control projects. Minimum Experience: Typically requires 6 months of related experience. Minimum Education: Associate's degree or equivalent from two-year college or technical school or six (6) months experience in control systems; or equivalent combination of education and experience.	\$178.91	\$142.72	\$168.04	\$171.22
334290, 238910, ANCILLARY, 561210FAC, 541690E	S167	Project Engineer I – Systems	Non-Exempt	Functional Description: Project development - Performs planning, estimating and design activities for the layout of equipment, commercial and industrial facilities. Assists in determining the scope of projects, estimates cost, designs and documents HVAC and electrical systems and procures components. Works directly on the project team to assist the Project Manager with project commissioning. Minimum Experience: Typically requires 4-5 years of related experience. Minimum Education: Associate's degree or equivalent from two-year college or technical school in electrical engineering and a certificate in HVAC or AAS and BAS in electrical engineering and 4-5 years related experience; or equivalent combination of education and experience.	\$118.79	\$138.81	\$168.04	\$148.17
334290, 238910, ANCILLARY, 561210FAC, 541690E	S168	Project Engineer I – Energy	Non-Exempt	Functional Description: Project development - provides technical analysis and review for performance monitoring on contracts. Applies knowledge of technology and applications on assigned projects. Minimum Experience: Typically requires 5-6 years of related experience. Minimum Education: Knowledge and 5-6 years experience with HVAC, control, electrical systems and proficiency with energy analysis tools such as TRACE and system analyzer. Working knowledge of cost and savings studies incorporating energy conservation measures.	\$118.79	\$138.81	\$168.04	\$148.17
334290, 238910, ANCILLARY, 561210FAC, 541690E	S169	Project Engineer I – Controls	Non-Exempt	Functional Description: Project development which includes applying engineering principles and practices on assigned projects. Designs cost effective control solutions to meet project requirements. Works directly on the project team to assist with project commissioning. Minimum Experience: Typically requires 4-5 years of related experience. Minimum Education: Associate's degree or equivalent from two-year college or technical school in electrical engineering and a certificate in HVAC or AAS and BAS in electrical engineering and 4-5 years related experience; or equivalent combination of education and experience.	\$118.79	\$138.81	\$168.04	\$148.17

Labor Categories under SIN 334290 Ancillary Services and SIN 238910 Installation Involving Construction

The rates shown above are for labor services performed during standard work hours and are the GSA ceiling rates (maximum price) for the region. These rates are adjusted to the Trane Commercial Sales Office (CSO) within the region where the work will be performed. An overtime premium is not charged for exempt overtime labor services (See Service Contract Act Exempt / Non-Exempt listing). That is not the case for non-exempt positions.

Overtime Rates. For NE labor services performed after the standard workday (typically 5:00pm), the published rates in appendices do not apply and this Standard-Time (ST) rate should be multiplied by 1.5 to obtain the Over-Time (OT) rate for applicable NE job descriptions. Saturday after noon (12pm), Sunday and holiday work is at Premium-Time (PT). It is typically double-time (standard rate is multiplied by 2.0). These premium rates are charged unless it is established up front that there will be a work week change, for example, the workweek for services will be Sunday to Thursday. This must be negotiated and agreed to by both parties up front. Also, some work on Saturdays may be considered. West = States of Arizona, Alaska, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oklahoma, Oregon, Texas, Utah, Washington, Wyoming
Central = States of Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
Northeast = States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Washington DC
Southeast = States of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia



Trane Parts Supply



At Trane Supply, we have the parts and the knowledge to support all of your HVAC needs, no matter what system you are working on. You can rely on us to deliver a solution to meet your needs, and to help you be more productive, profitable, and knowledgeable.

Along with our technical expertise, we focus on providing customers with the best availability of OEM parts for Trane equipment, including remanufactured OEM compressors, as well as ancillary parts and supplies needed to support your entire job, from start to finish.

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www.gsaadvantage.gov



TRACE 700 (CDS-PKG-C)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

As a systems and services provider, we understand the challenges of designing the most efficient, lowest cost HVAC system solution. That's why we developed Trane Air Conditioning Economics, or TRACE™—an [award-winning](#) design-and-analysis software program that helps HVAC professionals optimize the design of a building's heating, ventilating and air-conditioning system based on energy utilization and life-cycle cost. TRACE™ 700 Load Design and TRACE™ 700 Load Express are integrated within the tool.

Features

TRACE 700 helps you compare the energy and economic impact of building-related selections such as:

- architectural features
- HVAC systems
- HVAC equipment
- building utilization or scheduling
- financial options.

Licensing Description

SINGLE. Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



Trane Acoustics Program (CDS-PKG-D)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

Acoustic levels can be a key element of high performance indoor environment quality, and they are often difficult to determine. Trane Acoustical Program is updated to incorporate changes made by ASHRAE. As a result, Trane Acoustical Program is an excellent tool for predicting background sound levels from HVAC equipment. The program can be used to meet LEED® for Schools EQ Prerequisite 3 and EQ Credit 9.

Features

Trane Acoustical Program analysis software makes it easy to:

- Accurately predict and compare system sound levels
- Quickly compare the sound characteristics of several system alternatives

Licensing Description

SINGLE. Provides a single annual license to use the “Software”. The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



System Analyzer (CDS-PKG-W)

Length: N/A	Software Type: Analysis Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

System Analyzer is a comparative analysis tool for preliminary evaluations of HVAC systems based on energy and economic performance. Use it to quickly evaluate virtually any combination of air distribution system(s) and cooling/heating equipment for a specific building type and weather location. The intuitive reports and graphs help you evaluate the benefits of prospective system designs, which systems might be appropriate for an initial design, or to get a general idea of how one system-and-equipment combination performs when compared with another.

Features

System Analyzer Advantages include:

- Integration with TRACE 700
- Streamlined entries
- Expanded modeling capabilities
- Simplified file sharing
- EER units available for defining equipment energy rate
- Plant level thermal storage
- Secondary coil assignment to a separate utility

Licensing Description

SINGLE. Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



TRACE 700 Load Design (CDS-PKG-A)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

TRACE 700 Load software is a separate program incorporating the load and system portion of TRACE 700. In other words, it contains the functionality of TRACE minus the energy and economic portions of the program. Use this program to complete complex building load calculations for virtually any building. TRACE 700 Load Design provides all of the options and modeling capabilities you expect in a comprehensive load analysis tool, combined with a whole new level of usability that makes load design easy.

Features

TRACE 700 Load design modeling and features include:

- Load Phase
- Day/Hour/Zone Calculations
- Design Phase
- Assignment of Loads
- System cooling Supply-Air Dry Bulb (SADBc)
- System Airflows/Cooling/Heating Capacity
- Design Calculation Summary

Licensing Description

SINGLE. Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



TRACE 700 Load Express (CDS-PKG-T)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

TRACE 700 Load Express is Trane’s HVAC design tool for your light commercial design needs. This quick and easy software application uses ASHRE-approved algorithms to calculate cooling and heating loads, as well as airflow capabilities.

Features

TRACE 700 Load Express allows designers to perform accurate calculations in minutes based on inputs such as:

- Weather Profile
- Defined Templates
- Room Parameters
- Air Handling System
- Room specific system assignments

Licensing Description

SINGLE. Provides a single annual license to use the “Software”. The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



TRACE 700 Chiller Plant Analyzer (CDS-PKG-CPA)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

TRACE 700 Chiller Plant Analyzer software saves time by allowing easy plant configuration comparisons with a detailed wizard. The program calculates the energy and economic effects of virtually any chiller plant configuration using load profiles generated based on location and pre-defined building types. The software using the accuracy of TRACE 700 calculation engine with basic user-defined inputs for cooling and heating peak loads, building type, and building location.

Features

TRACE 700 Chiller Plant Analyzer program incorporates five major phases to perform and provide a complete energy and economic analysis:

- Load Phase
- Design Phase
- Airside System Simulation
- Equipment Simulation
- Economic Phase

Licensing Description

SINGLE. Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



VariTrane Duct Designer (CDS-PKG-L)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

VariTrane Duct Designer streamlines duct design and improves calculation precision, letting you optimize your designs while obtaining a minimum pressure system. VariTrane Duct Designer enables you to organize the layout structure of your duct system and provides detailed engineering information on a section-by-section basis making revisions and updates easier. The software is based on engineering data and procedures outlined in the *ASHRAE Fundamentals Handbook*. It includes tested data from ASHRAE Fitting database and from United McGill to provide the most accurate modeling possible.

Features

VariTrane Duct Designer advantages include:

- Improved calculation precision
- Organizes and optimizes designs
- Updates and revisions made simple

Licensing Description

SINGLE. Provides a single annual license to use the “Software”. The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



Trane Pipe Designer (CDS-PKG-P)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

The Trane Pipe Designer streamlines the pipe design process. Use the program to determine required pipe sizes, find the critical path for proper pump sizing, and calculate pressure drops through valves/fittings or from elevation changes.

Features

Trane Pipe Designer helps you:

- Model new piping designs
- Evaluate existing piping systems
- Incorporate a combination of old and new layouts
- Examine open and closed systems
- Create a complete bill of materials

Licensing Description

SINGLE. Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



Distribution Suite (CDS-PKG-E)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

The Distribution Suite includes the Trane Pipe Designer software and VariTrane Duct Designer software sold together for a discount as the Distribution Suite package.

Features

Includes all the benefits and advantages of Trane Pipe Designer and VariTrane Duct Designer.

Licensing Description

SINGLE. Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



Trane Engineering Toolbox (CDS-PKG-J)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

Trane Engineering Toolbox provides nine calculation tools to simplify HVAC design and service tasks. The latest version of the Engineering Toolbox is an intuitive redesign that provides a consolidated input and output view, an advanced report generation method for comparing multiple datasets and additional refrigerant and fluid types.

Features

Trane Engineering Toolbox advantages include:

- Design and service tasks made easy
- Compare multiple items simultaneously
- Easy to read input and output view

Licensing Description

SINGLE. Provides a single annual license to use the “Software”. The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

Prerequisites

None.



TRACE 3D Plus Load Design (CDS-PKG-X)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site/Ent/Global	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

TRACE 3D Plus Load software is a separate program incorporating the load and system portion of the design process. In other words, it contains the functionality of TRACE 3D Plus minus the energy and economic portions of the program. Use this program to complete complex building load calculations for virtually any building. TRACE 3D Plus Load Design provides all of the options and modeling capabilities you expect in a comprehensive load analysis tool, combined with a whole new level of usability that makes load design easy.

Features

TRACE 3D Plus Load Design modeling and features include:

- Load Phase
- Day/Hour/Zone Calculations
- Assignment of Loads
- System cooling Supply-Air Dry Bulb (SADBc)
- Design Calculation Summary

Licensing Description

SINGLE. "Standalone" Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. "Limited Enterprise" This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

ENTERPRISE. "Enterprise" Requires the purchase of TRACE 3D Plus Enterprise Concurrent Seats (no seats included) and a TRACE 3D Plus license server installed on the company computer network. Provides a single annual base license to install the software at any company location on any company computer or supported interface device. Use of the software for each computer the software is installed upon is limited to the quantity of purchased Enterprise Concurrent Seats.

GLOBAL. "Global Enterprise" Provides an annual license to install and use the software at any company location on any company computer or supported interface device. Unlimited Seats.

Prerequisites

None.



Course Descriptions



TRACE 3D Plus (CDS-PKG-Y)

Length: N/A	Software Type: Design Tools	Software Cost: See Schedule	Licensing Option: Single/Site/Ent/Global	Recommended search: N/A
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Purchase Now! Trane C.D.S. Software

Software Description

TRACE® 3D Plus is a next generation building design and analysis software program that delivers faster, more accurate results through a seamless workflow that closely aligns with today's building process. The latest HVAC systems and controls can be modeled quickly, precisely and with the intricacies of today's many building applications. TRACE 3D Plus is built on the U.S. Department of Energy's EnergyPlus engine and enhanced with Trane's industry leading expertise to help designers validate and interpret projects with confidence and clarity. All of these new features plus a more robust support experience to get you up and running quickly. TRACE 3D Plus allows you to move from project plan to load design to energy and economic analysis all through the same project file and interface. Import 3D models directly from CAD using Green Building XML (gbXML), or import floor plans and trace over using the draw tools. Easily create and validate your architectural design and HVAC systems in 2D or 3D.

Features

TRACE 3D Plus advantages include:

- Faster modeling process with visually dynamic workflows
- Create schedules faster with graphical plotting and drag-and-drop features
- Use pre-configured building themes and thousands of pre-loaded and scalable libraries and templates
- Schematically configure systems and plants easily with built-in systems validation and intelligence

Licensing Description

SINGLE. "Standalone" Provides a single annual license to use the "Software". The software may be installed and used on a single computer or supported interface device which can be directly accessed by only one user at a time, and which is not accessible to users on other computers.

SITE. "Limited Enterprise" This license comes with one Seat and provides a single annual base license to install the software at any company location on any company or supported interface device based on the number of Seats that have been purchased.

ENTERPRISE. "Enterprise" Requires the purchase of TRACE 3D Plus Enterprise Concurrent Seats (no seats included) and a TRACE 3D Plus license server installed on the company computer network. Provides a single annual base license to install the software at any company location on any company computer or supported interface device. Use of the software for each computer the software is installed upon is limited to the quantity of purchased Enterprise Concurrent Seats.

GLOBAL. "Global Enterprise" Provides an annual license to install and use the software at any company location on any company computer or supported interface device. Unlimited Seats.

Prerequisites

None.



Tracer Summit® System Operation (BSC01)

Length: 3.5 days	Day and time: Day 1-3: 8 a.m.–4:30 p.m.; Day 4: 8:00–11:30 a.m.	Continuing Education Units: 2.5	Recommended search: System Operation
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Register Now! Trane Education Center

Course Description

In this course students will learn to perform common and advanced operations with their installed Tracer Summit building management system. This highly interactive basic course includes presentations and hands-on workshops where students practice using the common applications of a Tracer Summit building management system and learn how to monitor and control building mechanical systems.

Note: This is a good course to take if you're planning to take Tracer Summit 101.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Create and modify schedules/holidays and exceptions.
- Create, modify and plot graphs of trends.
- Respond, route and print alarms.
- Create and modify users and passwords.
- Create and modify basic graphics.
- Monitor chiller plant control.
- Apply knowledge of schedules, area, and variable air systems applications to controls building air systems.

Who Should Attend

Tracer Summit System Operations is intended for Trane service technicians and Tracer Summit system owners, building engineers and operators.

Prerequisites

None

Pre-Work

None



Tracer Summit® 101 (BSC02)

Length:	Day and time:	Continuing Education	Recommended search:
4.5 days	Day 1-2: 8 a.m. – 5p.m.; Day 3: 8:00 –11:30 a.m.	Units: 3.2	Summit 101

Register Now! Trane Education Center

Course Description

This Tracer Summit installation course is intended for BAS personnel and Applied Systems Contractors who will be responsible for engineering, installing and commissioning Tracer Summit Projects. The skills taught in the installation workshops are intended for those who will install Tracer Summit hardware and configure applications.

Specific Source Objectives

Upon completion of this course, participants should be able to:

- Install BCU hardware.
- Apply Ethernet LAN protocols in the HVAC system.
- Configure a BCU with an IP address.
- Configure a site.
- Install LonTalk® devices on a BCU including Generic LonTalk Devices (GLDs).
- Install Trane Legacy Comm 3/4 devices.
- Configure Area and VAS applications.
- Create schedules.
- Configure alarm and message routing.
- Create and configure points.
- Create custom graphics.
- Back up and restore a site.

Who Should Attend

Tracer Summit 101 is intended for Trane technicians and applied systems contractors.

Prerequisites

While not a required prerequisite, Tracer Summit System Operation is highly recommended prior to taking Tracer Summit 101.

Pre-Work

All pre-work must be completed prior to coming to class. Students will be tested on this material the first day.

Required pre-work includes:

- Introduction to LonTalk self-paced learning





Tracer Summit® 102 (BSC03)

Length: 4.5 days	Day and time: Day 1-4: 8 a.m.–5 p.m.; Day 3: 8:00 –11:30 a.m.	Continuing Education Units: 3.2	Recommended search: Summit 102
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Register Now! Trane Education Center

Course Description

Students are introduced to the standard Tracer applications included with the Tracer Summit software through lecture and extensive hands-on workshops. In addition to the standard Tracer applications, the course also covers the custom programming language (CPL) used in Tracer Summit.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Set up and operate area control.
- Set up and operate Variable Air Systems (VAS) [Comm4 and LonTalk*].
- Set up and operate Chiller Plant Control (CPC).
- Write programs using CPL.

Who Should Attend

Tracer Summit 102 is intended for Trane technicians and contractors who have successfully completed Tracer Summit 101 and have a solid working knowledge of those subjects.

Prerequisites

- Tracer Summit 101

Pre-Work

All pre-work must be completed prior to coming to class. Students will be tested on this material the first day.

Required pre-work includes:

- Online document attached to course details in your Trane Education Center account



Tracer® SC Operation (BSC04)

Length:
2.5 days

Day and time:
 Day 1-2: 8 a.m.–4:30 p.m.;
 Day 3: 8:00 –11:30 a.m.

**Continuing Education
Units:**
1.8

Recommended search:
SC Operation

Register Now! Trane Education Center

Course Description

In the Tracer SC Operation course, students learn to operate and modify an installed Tracer SC system. This highly interactive course includes presentations, demonstrations and hands-on workshops where students practice using the software applications integral to a Tracer SC building management system.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Monitor and control building mechanical systems.
- Utilize contract documentation to identify control component locations.
- Create new user accounts and control their level of access within the Tracer SC.

- Navigate the Tracer SC user interface.
- Create and modify custom time-of-day schedules.
- Apply knowledge of schedules, area, and variable air system applications to control building air systems.
- Respond to hot and cold calls.
- Respond to alarm conditions.
- Generate data logs and reports.
- Back up your Tracer SC.

Who Should Attend

Tracer SC Operations is intended for Trane service technicians and Tracer SC system owners, building engineers and operators.

Prerequisites

Introduction to the Tracer SC System e-learning module is recommended but not required.

Pre-Work

None





Tracer® SC Advanced Operation (BSC05)

Length:
3 days

Day and time:
Day 1–3: 8 a.m.–4:30 p.m.

**Continuing Education
Units:**
2.1

Recommended search:
Advanced Operation

Register Now! Trane Education Center

Course Description

The Tracer SC Advanced Operation course builds on the knowledge and skills learned in the Tracer SC Operation course. This course will enable learners to expand their skillset to complete a variety of advanced operations, control strategies and energy saving methods to get the most value out of their Tracer SC building control system.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Define and apply coordinated control methods using spaces, Area, VAV Air Systems and schedules.
- Create area application and understand the different configurations options.
- Create HVAC, analog and binary schedules.
- Set up and modify data logs with advanced configurations.
- Use Tracer TU™ to backup, restore and upgrade firmware for Trane unit controllers.
- Configure alarming for binary and analog points.
- Create custom alarm categories and notification classes.
- Route alarm categories to users.
- Work with Tracer Graphical Editor (TGE) to modify graphics.

Who Should Attend

Tracer SC Advanced Operation is intended for Tracer SC system owners, operators and building engineers who have previously completed the Tracer SC Operation course and want to go deeper.

Prerequisites

- Tracer SC Operation

Tracer SC Advanced Operation is an advanced operations course. Students must also be proficient at using a personal computer and familiar with using a web browser.

Pre-Work

None



Tracer Ensemble™ Operation (BSC09)

Length: 2.5 days	Day and time: Day 1-2: 8 a.m.–4:30 p.m.; Day 3: 8:00 –11:30 a.m.	Continuing Education Units: 1.8	Recommended search: Ensemble Operation
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Register Now! Trane Education Center

Course Description

Tracer Ensemble Operation is specifically designed for building operators and administrators to become more efficient with their Tracer Ensemble software which is a Web-enabled service and monitoring tool for multiple building facilities. Tracer Ensemble allows building operators and administrators access to Tracer Ensemble from the local network or the Internet to monitor and control their building system. Students will have the opportunity to work with the Tracer Ensemble software to become more familiar with common tasks.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Create user roles and user profiles
- Navigate Tracer Ensemble Buildings
- Use override control to manipulate building systems
- Make changes to building schedules
- Manage building alarms
- Log data
- Create custom reports
- Set up Tenant Services
- Use Critical Control to limit access in Tracer Ensemble

Who Should Attend

Tracer Ensemble Operation is intended for building operators and owners with Tracer Ensemble.

Prerequisites

This is an operations-level class. Students must have an operating-level understanding of personal computers and the Windows operating system. Students must possess knowledge of Tracer Summit or Tracer SC depending upon which system is installed in their facility.

Pre-Work

None



Training Packages

Trane University can provide private training if you are unable to attend one of our scheduled classes. Trane University professional education private training is offered through two tracks.

1. Building Systems and Controls Private Class (BSC010, BSC011, BSC012, BSC013), focusing on system design and optimization, is valuable for

- Facility owners and management
- Engineers

2. Technical Service Private Class (TS021, TS022, TS023),

focusing on operation, maintenance and troubleshooting, was developed for:

- HVAC service and maintenance technicians
- Maintenance supervisors
- Mechanical contractors

Customer controls attendee list and pays Trane a fixed rate dependent upon number of days training requested and selects a custom course schedule of training courses offered. Trane University supplies instructor, all equipment needed, and any teaching materials.



Air Conditioning Service (TS01)

Length:
4.5 days

Day and time:
Mon–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
3.2

Recommended search:
Air Conditioning Service

Register Now! Trane Education Center

Course Description

This is a comprehensive, entry-level air conditioning service course. It concentrates on essential refrigeration knowledge that all HVAC technicians must eventually possess in order to perform competent HVAC service work. After attending, technicians should have acquired knowledge in tool usage, basic system theory, metering devices, system problem identification, superheat, sub-cooling, piping, evacuation and recharging techniques.

This course is 45–50 percent lab intensive. Packaged rooftop units, 2 to 5 tons, are used in the lab sessions. A separate course is available to help develop electrical troubleshooting skills.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Draw and explain basic system theory.
- Identify the four basic parts of the refrigeration system and how they work.
- Use refrigeration instruments.
- Perform system logging.
- Perform system evacuation and charging.
- Diagnose and correct start up and service problems related to refrigeration systems.
- Measure and adjust superheat and sub-cooling using classroom methods.
- Demonstrate refrigerant recovery procedures.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is well suited for entry-level air conditioning and/or HVAC maintenance mechanics, service technicians and industrial or facility maintenance technicians. An electrician with new responsibilities in air conditioning maintenance and service will also benefit.

Qualifications

The student should have some basic mechanical and electrical background in addition to an aptitude and interest for work with HVAC equipment.





Commercial Service 1 (TS02)

Length:
4.5 days

Day and time:
 Mon–Thu: 8 am–4:30 pm
 Fri: 8–11 am

**Continuing Education
 Units:**
3.2

Recommended search:
Commercial Service 1

Register Now! Trane Education Center

Course Description

This course exposes the student to light commercial unit operation, set-up and troubleshooting, dual compressor units, refrigerant troubleshooting, heating fundamentals, combustion analysis and unit airflow set-up and checkout. Hands-on training, using Trane light commercial 5- to 25-ton lab equipment, enhances the existing knowledge of technicians who already have appropriate fundamental A/C service skills. The course emphasizes a systematic approach to HVAC service troubleshooting.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Interpret temperature/pressure readings on an operating system.
- Discuss start-up and service problems within a refrigeration system.
- Measure airflow using appropriate airflow instruments to determine basic airside problems.
- Determine heating efficiency.
- Check gas systems using proper test procedures.
- Use ANSI*/Trane wiring diagrams to properly test single- and three-phase electrical systems and components.
- Demonstrate the basics of psychrometrics.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is ideal for dealer, contractor or owner maintenance technicians progressing from residential to light commercial service who have experience in HVAC.

Prerequisites

We recommend attendees meet one of the following:

- Completion of a vocational or technical program in air conditioning/refrigeration
- At least 1.5 years practical experience
- Completion of the Air Conditioning Service Course or HVAC Electrical Troubleshooting Course

Qualifications

Students must also have a working knowledge of the basic theory needed to diagnose the refrigeration cycle and an understanding of the following tools and subjects:

- Refrigeration Manifold Gauge Set
- Volt/Ohmmeter
- Electronic Temperature Meter
- Clamp-on ammeter
- Temperature/Pressure Relationships
- Metering Devices



Airside System Service (TS03)

Length: 4.5 days	Day and time: Mon–Thu: 8 am–4:30 pm Fri: 8–11 am	Continuing Education Units: 3.2	Recommended search: Airside System
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Register Now! Trane Education Center

Course Description

This course covers the operation and setup of a commercial VAV system from the standpoint of the service technician. Shutoff VAV, Bypass VAV and Single Zone VAV will be discussed in the class, although Shutoff VAV (traditional VAV) will be the primary focus. The concepts discussed will apply to new system startup as well as existing buildings. The course also discusses the different fan types used in commercial HVAC units.

The lab exercises are designed around several working VAV systems in our La Crosse, Wisconsin, training lab. This includes IntelliPak® Commercial Self-Contained (CSC) and rooftop units (RTU) with various types of VariTrane® VAV boxes. During the lab exercises, students will use the various tools needed to setup and commission (or re-commission) a VAV system. Also, the Rover™ service tool will be used for VAV box setup and for the purpose of verifying proper system operation from a service perspective. Attendees will learn to recognize important parameters within building plans in order to commission the building as the design engineer intended. The plans used will include the equipment schedule, sequence of operation, airflow requirements, and ventilation.

The course includes systems used in all geographic regions.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Verify system airflow using multiple methods.
- Interpret fan curve data from the various fan types such as forward curve, airfoil, and direct drive plenum.

- Set up and verify proper system air with the fan types used in our lab.
- Describe the capabilities and the limitations of the building control system from a service technician standpoint.
- Using a Rover service tool, analyze air delivery on multiple VAV systems.
- Describe the difference between Single Zone VAV systems and Multiple Zone VAV systems.
- Go through the procedure required to establish the supply pressure setpoint on a VAV system.

Lab Safety

Student participation in any hands-on portion of this course will include ladder safety and use of proper fall protection. It is expected the student will adhere to all other safety requirements as they arise.

Who Should Attend

This course is ideal for advanced service, controls, and maintenance technicians, as well as service contractors. Existing Building Systems personnel and others involved with system commissioning or with ensuring that an HVAC system is operating correctly and efficiently would benefit from this course.

Qualifications

Participants attending this course must have strong HVAC skills or an understanding of engineered building systems. They should also understand the importance of compliance with today's energy efficiency requirements.



HVAC Electrical Troubleshooting (TS04)

Length:
4.5 days

Day and time:
Mon–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
3.2

Recommended search:
Electrical Troubleshooting

Register Now! Trane Education Center

Course Description

This course is intended to improve a technician's ability and confidence when electrically troubleshooting commercial HVAC equipment. The course will broaden the technician's capabilities to troubleshoot controls and other electrical circuits by teaching an understanding of practical electrical theory as applied to the products and components found in HVAC. The information and skills learned should greatly decrease service diagnosis time and take the guesswork out of isolating problems found in single and three-phase air conditioning and heating products. This course makes extensive use of lab hands-on methods.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Define and use fundamental electrical terms, laws and formulas for understanding what electricity is and what it does.
- Discuss the basics of series, parallel and series-parallel circuits.
- Identify the proper usage of meters required to troubleshoot electricity.
- Increase confidence and ability in reading complex wiring diagrams.
- Discuss the control logic and sequence of unit operation.
- Discuss safeties and component operation in Trane equipment.

- Recognize characteristics of single- and three-phase motors and their associated control components.
- Discuss the principal maintenance requirements for longer operating life of electrical components.
- Practice systematic methods of electrical troubleshooting for all major HVAC products.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is ideal for HVAC installers, maintenance mechanics, industrial electrical technicians and apprentice level service technicians who have HVAC servicing responsibility and need a thorough understanding of electrical troubleshooting skills.

Qualifications

Students must have an understanding of the refrigeration cycle and its components.



Chilled Water Systems Service (TS05)

Length:
3.5 days

Day and time:
Tue-Thu: 8 am-4:30 pm
Fri: 8-11 am

Continuing Education
Units:
2.5

Recommended search:
Chilled Water

Register Now! Trane Education Center

Course Description

This course is intended to provide attendees with a 'systems' approach to maintaining and diagnosing problems involving chilled water piping systems from a service perspective. It will show technicians and supervisors how Trane utilizes water flows to obtain efficient chiller operation. The course will also discuss water system conditions that can be detrimental to efficient operation and possibly damaging to system components. Students will take flow measurements in a laboratory setting, using recommended tools and techniques to determine chilled water system performance. Chilled water system types such as decoupled loop, variable-primary flow and others will be discussed.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Demonstrate an understanding of the water principles as applied to a chilled water system.
- Calculate the loop size in a chilled water system in order to understand and prevent short loop issues.
- Measure and verify water flow on a simple chilled water system using a variable frequency drive.
- Calculate water flow in a system using various methods.
- Given the necessary tools, service literature and personal protective equipment (PPE); properly log multiple chillers in our hands-on lab.
- Using operating pumps, calculate flow and then plot changes of flow using a balancing valve.
- Calculate unit capacity on a chiller by using proper tools and methods.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for plant engineers, maintenance supervisors, operating engineers, HVAC service technicians, and maintenance technicians who need an improved understanding of air and chilled water system control and maintenance requirements and techniques.

Qualifications

This course addresses the needs of persons from widely varied backgrounds and does not require in-depth HVAC knowledge. Students should be ready, however, to assimilate HVAC 'systems' thinking.





CenTraVac® System Operation and Maintenance (TS06)

Length:
3.5 days

Day and time:
Tue–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
2.5

Recommended search:
System Fundamentals

Register Now! Trane Education Center

Course Description

This course will familiarize owner maintenance supervisors and technicians with Trane CenTraVac CVHE/F/G/L centrifugal chiller operation and maintenance requirements. It will assist them understanding chilled water systems and load-based chiller dynamics. The course will help technicians troubleshoot and will help chiller owners decide if work can be done in-house or not. Technicians can particularly benefit from coverage on diagnosing and maintaining machine design performance, and learn what can occur if operating outside of these parameters. Students will have the opportunity to observe the manufacturing and the assembly of key components in a factory tour. This course relies primarily on classroom lecture and does not include hands-on maintenance training.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe Trane centrifugal chiller operation and chilled water system theory.
- Observe chiller construction process.
- Use operating logs to recognize normal operation and how abnormal influences affect chiller operation and performance.
- Recognize problems that reduce efficiency and damage equipment.
- Identify system components and their role in the system.
- Identify chilled water piping designs.

Who Should Attend

Our target is individuals responsible for the operation and preventative maintenance of Trane CenTraVac chillers (CVHE/F/G/L). This course will benefit technicians, supervisors or engineers who make planning decisions to support centrifugal chiller maintenance.

Qualifications

Students will benefit from this course in direct relation to their background knowledge of refrigeration, electrical, mechanical, and basic heat transfer systems. This course addresses the needs of individuals from widely varied backgrounds and does not require in-depth HVAC knowledge.

Plant Tour Requirement

Leather shoes which give good protection and long trousers are required. Neither sandals nor cloth-top shoes are permitted in manufacturing areas.



CenTraVac® Electronic Controls (TS07)

Length:
3.5 days

Day and time:
Tue–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
2.5

Recommended search:
Electronic Control

Register Now! Trane Education Center

Course Description

This course is intended to update experienced service technicians on Trane CenTraVac chiller control technology. Detailed coverage includes electronic capacity modulation controls found on all Trane centrifugal chillers manufactured between 2001 and the present. Earlier-model control systems are not discussed in depth. This course covers Tracer® CH530 and Tracer AdaptiView™ control system in use at this time.

This is a controls technology class only. Mechanical service course attendance is required for complete CenTraVac Chiller service coverage.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Operate all the controls covered by this course, including systems interface.
- Describe operating logic for Tracer CH530 and Tracer AdaptiView control platforms.
- Use control information for routine operational troubleshooting.
- Use menu-driven diagnostics.

Functionally diagnose various components of an operating control panel.

- Perform detailed trouble analysis on controls and determine necessary field repairs or replacement action.
- Determine potential electrical or electronic control faults through recommended isolation checkout procedures.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is for technicians who regularly work with Trane CenTraVac CVHE/F/G/L and duplex chillers.

Qualifications

Technicians must be comfortable with electrical controls, electrical meters such as digital volt-ohmmeters and understand refrigeration and centrifugal chiller control requirements. It is helpful if technicians have experience with other HVAC electronic control systems or have attended Trane University's HVAC Electrical Troubleshooting course. Familiarity with basic computing skills, file management and internet downloading procedures is also desirable.

Plant Tour Requirement

Leather shoes which give good protection and long trousers are required. Neither sandals nor cloth-top shoes are permitted in manufacturing areas.





CenTraVac® Mechanical Overhaul Service (TS08)

Length:
4.5 days

Day and time:
Mon–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
3.2

Recommended search:
Mechanical Service

Register Now! Trane Education Center

Course Description

This course will broaden any technician's level of service and overhaul expertise. It will help them gain confidence and experience in system start-up, maintenance, repair and major overhaul of water-cooled CenTraVac chillers. The course provides learning situations not otherwise available or that may take months or even years of on-the-job exposure to encounter. This course lays a substantial foundation for the technician's continued professional growth and provides familiarity with other centrifugal chiller products. This is a mechanical service course only. Controls course attendance is required for complete CenTraVac chiller service coverage.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Identify various Trane centrifugal chillers and variations in mechanical components.
- Be familiar with documented factory service information available to support Trane centrifugal chillers.
- Properly maintain and repair chillers with varying lubrication and cooling system designs.
- Properly overhaul a Model CVHE/F/G/L CenTraVac chiller compressor and motor, using factory-recommended procedures.
- Properly inspect compressor and motor components for compliance to factory specifications.

Lab Safety

Students are required to wear steel-tipped footwear, safety glasses and gloves to participate in mechanical lab service procedures. Appropriate work clothes should be worn to disassemble a chiller.

Who Should Attend

This course is designed for technicians or mechanics who have experience in other HVAC chiller products and are beginning to work with centrifugal products. The class is useful for experienced centrifugal service technicians who have no formal centrifugal overhaul training or experience with Trane CenTraVac chillers.

Qualifications

In order to attend this course, a student must meet the following qualifications:

- Previous heavy refrigeration service experience
- Skills with close tolerance measuring instruments
- Experience with shop rigging of components heavier than 150 lbs

Plant Tour Requirement

Leather shoes which give good protection and long trousers are required. Neither sandals nor cloth-top shoes are permitted in manufacturing areas.



Single-Stage Absorption Chillers (TS09)

Length:
4.5 days

Day and time:
Mon–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
3.2

Recommended search:
Single

Register Now! Trane Education Center

Course Description

This course is a thorough and comprehensive presentation on the foundational understanding of absorption chillers and their refrigeration cycle. Coverage includes a detailed view of absorption chiller components, detailed instruction in the “theory of absorption chiller operation” and in the lithium bromide chemical cycle, the chemistry of inhibitors, overview of capacity control system operation, crystallization causes and effects, purge system operation, performance and operator logging recommendations.

This course utilizes a fully operational absorption chiller with UCP2 micro control. This provides our students a practical, hands-on opportunity to attain the confidence they need to work with these chillers.

IMPORTANT: Be certain that you or your prospective student meets the educational and/or experience requirements to attend this course. Read the “Prerequisites” section carefully.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe absorption chiller construction.
- Recognize major absorber components and describe their functions.
- Discuss the characteristics of lithium bromide in relation to charging and inhibitors.
- Use an Equilibrium Chart to determine system conditions.
- Describe the sequence of control operation (pneumatics and electric).

- Demonstrate how Trane’s UCP2™ Adaptive Control™ technology has been applied to absorption chillers.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is for technicians who desire a comprehensive understanding of the theory of absorption refrigeration systems.

Qualifications

The student should have a working knowledge of pneumatic, electrical, heat transfer, steam and mechanical systems.



RTAA Rotary Chillers (TS10)

Length:
3 days

Day and time:
Tue–Thu: 8 am–4:30 pm

Continuing Education
Units:
2.1

Recommended search:
RTAA

Register Now! Trane Education Center

Course Description

This course provides training for service and facility maintenance technicians who need an in-depth understanding of the controls, maintenance and troubleshooting of Trane's RTAA and RTWA helical-rotary chillers. The course provides insights into compressor design, unit operation, unit installation, start-up requirements, unit performance and service diagnosis. Specific service steps are covered for refrigerant handling and component service.

This course is primarily classroom oriented.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe the theory of helical rotary chiller operation.
- Discuss chiller components and the interrelationships.
- Describe the capabilities of individual chiller designs.
- Read unit wiring and interconnecting diagrams.
- Describe control start sequence and operating logic.
- Discuss system control methods available for building automation.
- Use control information for routine operational troubleshooting.
- Complete routine maintenance requirements for helical-rotary chillers.
- Discuss the limits to field service methods inherent to helical compressor designs.
- Apply proper service techniques with refrigerant handling and component repairs.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for contractors and in-plant HVAC service technicians who will work regularly with Trane RTAA, air-cooled and RTWA water-cooled chillers.

Qualifications

Technicians must have solid electrical skills equal to Trane University's HVAC Electrical Troubleshooting course standards. Service experience with other types of liquid chillers and/or Trane's UCP1 and UCP2™ chiller control system would be helpful, but are not required.





RTAC Rotary Chillers (TS11)

Length:
3 days

Day and time:
Tue-Thu: 8 am-4:30 pm

**Continuing Education
Units:**
2.1

Recommended search:
RTAC

Register Now! Trane Education Center

Course Description

This course covers operation, diagnosis and maintenance for Trane model RTAC rotary chiller CH530 micro electronic control system with additional coverage of refrigeration system components. Emphasis will be placed on operational characteristics of the GP2 compressor, Falling Film evaporator and E-coil design condenser. Additional coverage provided for chiller operation using unit ANSI® Trane wiring diagrams with emphasis on understanding the Adaptive control system logic. Tracer CH530 control architecture and components will also be discussed. This course is primarily classroom oriented.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Discuss the operating characteristics of 140- to 500-ton Trane RTAC rotary chiller machines.
- Explain RTAC chiller construction and the physical relationship of components.
- Describe GP2 compressor construction, operation and checkout.
- Describe Falling Film evaporator construction and operation.
- Discuss the Tracer CH530 control architecture and operating logic.
- Explain the field maintenance and limitations of the Trane RTAC rotary chiller.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for owners, contractors and in-plant HVAC service technicians who will work regularly with Trane RTAC rotary chillers.

Qualifications

Technicians must have solid electrical skills equal to Trane University's HVAC Electrical Troubleshooting course standards. Service experience with other types of liquid chillers and/or the Trane UCP1 and UCP2™ chiller control system would be helpful, but are not required. Familiarity with basic computing skills, file management and internet downloading procedures is also desirable.





RTAE Rotary Chillers (TS12)

Length:
3 days

Day and time:
Tue–Thu: 8 am–4:30 pm

**Continuing Education
Units:**
2.1

Recommended search:
RTAE

Register Now! Trane Education Center

Course Description

This course covers the operation of Trane RTAE stealth rotary chillers. Coverage includes chiller refrigeration system components, construction and operation. Emphasis will be placed on the operational characteristics of the GP4 compressor, CHIL evaporator, Transverse condenser and AFD3 cooling circuit. Additional coverage will be provided on the Trane RTAE UC800 control platform with TD7 AdaptiView™ display, chiller logging and maintenance requirements. This course is primarily classroom oriented.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe the operating characteristics of a RTAE rotary chiller.
- Identify Trane RTAE rotary chiller construction and the physical relationship of components.
- Describe GP4 compressor operation.
- Describe the RTAE CHIL evaporator construction and operation.
- Discuss the Trane RTAE UC800 control platform and operating logic.
- Perform the field service, maintenance of Trane RTAE rotary chillers.
- Identify how the AFD3 Drive works as it relates to Trane RTAE rotary chillers.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for owners, contractors and in-plant HVAC service technicians who will work regularly with Trane RTAE rotary chillers.

Qualifications

The student must have solid electrical skills equal to Trane University's HVAC Electrical Troubleshooting course standards. Service experience with other types of liquid chillers and/or the Trane CH530 chiller control system would be helpful but are not required.



RTHD Rotary Chillers (TS13)

Length:
3 days

Day and time:
Tue–Thu: 8 am–4:30 pm

**Continuing Education
Units:**
2.1

Recommended search:
RTHD

Register Now! Trane Education Center

Course Description

This course covers the operation and maintenance of Trane RTHD helical rotary chiller with Tracer™ CH530 and UC800 control platforms. Coverage includes discussion on the CH530 and UC800 micro electronic controls in addition to refrigeration system components and operational logging. Emphasis will be placed on chiller sequence of operation, construction of refrigeration system components and the chiller's Adaptive Control™ system logic. This course is primarily classroom oriented.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe the operating characteristics of Trane RTHD helical rotary chillers.
- Explain the differences between Tracer CH530 and UC800 control platforms.
- Discuss the service, maintenance and limitations of Trane RTHD rotary chillers.
- Describe Trane RTHD rotary chiller compressor operation with and without TR200 VFD.

Who Should Attend

This course is intended for contractor and in-plant HVAC service technicians who will work regularly with Trane Series R chillers.

Qualifications

The technician must have solid electrical skills equal to Trane University's HVAC Electrical Troubleshooting course standards. Service experience with other types of liquid chillers and/or Trane's UCP1 and UCP2™ is helpful but not required. Familiarity with basic computing skills, file management and internet downloading procedures is also desirable.





RTWD Rotary Chillers (TS14)

Length:
3 days

Day and time:
Tue–Thu: 8 am–4:30 pm

**Continuing Education
Units:**
2.1

Recommended search:
RTWD

Register Now! Trane Education Center

Course Description

This course provides an in-depth understanding of the controls, maintenance and troubleshooting of the Trane RTWD (CH530) helical rotary chiller. The course also provides insight into compressor design, unit operation, unit performance and service diagnosis. This course is primarily classroom oriented.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe the theory of operation of the Trane RTWD.
- Discuss Trane RTWD platform service procedures, maintenance and troubleshooting.
- Discuss the CH530 control system.
- Explain how the GP2 compressor operates.
- Describe gas pump operation.
- Discuss the problems associated with oil loss.
- Describe oil return.

Who Should Attend

This course is intended for contractor and in-plant HVAC service technicians who will work regularly with Trane Series R chillers.

Qualifications

The student must have solid electrical skills equal to Trane University's HVAC Electrical Troubleshooting course standards. Service experience with other types of liquid chillers and/or Trane's UCPI™ and UCP2™ is helpful but not required. Familiarity with basic computing skills, file management and internet downloading procedures is also desirable.



Precedent® Voyager™ Rooftops (3–25 Ton Units) (TS15)

Length:
3.5 days

Day and time:
Tue–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
2.5

Recommended search:
Precedent

Register Now! Trane Education Center

Course Description

This course is designed to provide commercial service technicians in-depth comprehensive coverage of the Trane Precedent and Voyager rooftops with ReliaTel™ controls. Students will be exposed in detail to the mechanical, electrical and control systems of these units and will become knowledgeable in the start-up, maintenance and troubleshooting requirements of these products. This course will also cover updates for each of these units including fans, compressors and refrigerant.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Explain CV, SZVAV and MZVAV unit operation and proper airflow adjustment.
- Demonstrate the ability to read and follow a ReliaTel® schematic.
- Demonstrate proper gas heating checkout and troubleshooting.
- Demonstrate the ability to test and troubleshoot Zone Sensor modules.
- Apply proper techniques to service, diagnose and troubleshoot Precedent and Voyager rooftops with ReliaTel controls.
- Explain the operation of the ReliaTel economizer with CO2 and DCV control.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for commercial rooftop service technicians who have a good understanding of both constant volume and variable air volume rooftops and systems and who need extended knowledge of the Trane Precedent and Voyager rooftops.

Qualifications

Students should have a good understanding of both the refrigeration and combustion cycles and understand airflow dynamics. Students should also be able to follow electrical ladder diagram logic and be familiar with commercial unitary equipment sequence of operation.

Plant Tour Requirement

Classes held in Clarksville TN: Leather shoes which give good protection and long trousers are required for plant tours. Neither sandals nor cloth-top shoes are permitted in manufacturing areas.



IntelliPak® I & II Rooftop Units (TS16)

Length:
4.5 days

Day and time:
Mon–Thu: 8 am–4:30 pm
Fri: 8–11 am

**Continuing Education
Units:**
3.2

Recommended search:
IntelliPak

Register Now! Trane Education Center

Course Description

The course focus's on operation, start-up and maintenance of 20 to 130 ton IntelliPak I and 90 to 162 ton IntelliPak II rooftop units. Proper service techniques will be discussed to include correct maintenance procedures and intervals. Factory recommended installation and start-up procedures will also be discussed. Attendees will be able to start-up, operate and program unit control microprocessors, as well as understand control logic and check-out procedures with unit diagnostics.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Using IntelliPak terminology, discuss rooftop unit functions.
- Demonstrate circuit board level troubleshooting by using an Intellipak wiring diagram.
- Practice configuration and setup of a unit using an Intellipak Human Interface.
- Demonstrate the proper setup procedure for cooling and heating.
- Discuss and demonstrate pressure transducer troubleshooting.
- Describe the basic IntelliPak sequences of operation.
- Describe scroll compressor construction and operation.
- Diagnose and troubleshoot IntelliPak binary and analog inputs and outputs.
- Test and verify modulating dehumidification.
- Demonstrate an understanding of CV, SZVAV, and VAV air flow properties.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for rooftop service technicians who have a good understanding of both constant volume and variable air volume rooftop units and systems and need additional knowledge regarding startup and maintenance procedures of Trane IntelliPak rooftop units.

Qualifications

Students must have a good understanding of both the refrigeration and combustion cycles and understand airflow dynamics. Students should also be able to follow electrical ladder diagram logic and be familiar with commercial unitary equipment sequence of operation.

Plant Tour Requirement

Leather shoes which give good protection and long trousers are required for plant tours. Neither sandals nor cloth-top shoes are permitted in manufacturing areas.





Scroll Chiller Service & Troubleshooting (TS18)

Length: 3.5 days	Day and time: Tue–Thu: 8 am–4:30 pm Fri: 8–11 am	Continuing Education Units: 2.5	Recommended search: Scroll Chiller
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Register Now! Trane Education Center

Course Description

This service level course covers the operation, diagnosis and troubleshooting for Trane CGAM liquid chiller 20 to 130 tons and CGWF scroll chiller 20 to 60 tons with additional detailed coverage of R-22 and R-410a refrigeration system components, chiller logging and maintenance procedures. Trane scroll CSHA, CHSD and CSHN compressors construction, operation, maintenance requirements and troubleshooting will also be discussed. Factory recommended installation, start up procedures and chiller logging will be discussed in detail.

This course involves extensive hands-on training.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Describe chiller construction and the relationship of components.
- Given the necessary tools, service literature and personal protective equipment (PPE) properly log a scroll chiller in our hands-on lab.
- Describe the compressor protection processes used with CH530 controls.
- Use the unit wiring and interconnecting diagrams to understand the unit.
- Describe the control start sequence and operating control logic.
- Replace a LLID on a chiller with CH530 control using TechView®.
- Generate an ASHRAE® chiller report on a chiller using TechView.

Lab Safety

Instructor provided PPE is required for the hands-on live circuit portion of this course. The proper clothing should also be worn: long pants and long sleeves of 100% cotton.

Who Should Attend

This course is intended for contractor and in-plant HVAC service technicians who will work regularly with Trane CGAM and/or CGWF scroll chillers.

Qualifications

The student must have solid electrical skills equal to Trane University's HVAC Electrical Troubleshooting course standards. Service experience with other types of liquid chillers and/or Trane's chiller control systems would be helpful but are not required. Familiarity with basic computing skills, file management and internet downloading procedures is also desirable.



IntelliPak® Human Interface Navigation and Status Menu (TS19)

Length:
1 Hour

Register here:
[Trane Education Center](#)

Recommended search:
Intellipak Human

Course Description

The IntelliPak Human Interface Navigation and Status Menu program walks a service technician through basic navigation and status screens for IntelliPak Rooftop Units 20 to 162 tons.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Effectively navigate the Intellipak Human Interface



ReliaTel™ Zone Sensor Testing (TS20)

Length:
30 Minutes

Register here:
[Trane Education Center](#)

Recommended search:
ReliaTel

Course Description

This course is designed to provide Trane service technicians with in-depth information on ReliaTel Zone Sensor Module testing and troubleshooting.

Specific Course Objectives

Upon completion of this course, participants should be able to:

- Discuss the basic operation of a Zone sensor.
- Demonstrate how to properly test the Zone Sensor Module.
- Troubleshoot the Zone Sensor Module

System Analyzer Training (CDS-TRNGL1)

System Analyzer is a comparative analysis tool for preliminary evaluations of HVAC systems based on energy and economic performance. Use it to quickly evaluate virtually any combination of air distribution system(s) and cooling/heating equipment for a specific building type and weather location.



The intuitive reports and graphs help you evaluate the benefits of prospective system designs, what systems might be appropriate for an initial design or to get a general idea of how one system-and-equipment combination performs when compared with another.

Trane C.D.S. offers an 8-hour class providing users with a better understanding of System Analyzer allowing them to more effectively use the program. Concepts learned during the training include...

- Learn how to navigate the program and gain a better understanding of the various input fields.
- Discover how the program uses inputs to determine energy consumption and life cycle costs.
- Understand program assumptions and how they relate to results.
- Learn how to create multiple alternatives to model various choices.
- Learn how to create custom library values for specific applications.
- Interpret results and learn how to read the various output reports.
- Practice using the program through in-class exercises
- Discover various resources available to help licensed users

The class was designed primarily for beginning users, but advanced users will find the class useful based on tips provided by the trainer. If you have questions regarding training, please contact Trane C.D.S. at cdshelp@trane.com or 608-787-3926.



TRACE 700 Load Design (CDS-TRNGL2)

TRACE 700 Load software is a separate program incorporating the load and system portion of TRACE 700. In other words, it contains the functionality of TRACE minus the energy and economic portions of the program. Use this program to complete complex building load calculations for virtually any building.

Trane C.D.S. provides a full day of training on TRACE Load Design. By the end of this course, you will be able to:

- Navigate the program and gain a better understanding of the various input fields.
- Understand how design weather is used to determine peak loads.
- Explain how TRACE™ calculates supply temperatures and airflows.
- Summarize the plenum heat balance calculations and how TRACE™ balances airflows.
- Explain how TRACE™ determines coil capacities and how to zone spaces.
- Utilize templates to reduce input time.
- Create multiple alternatives to model various choices.
- Create custom library values for items such as construction types, schedules, and shading plus others.
- Share files and understand the difference between a stand-alone and network installation.
- Summarize advanced features in the program (e.g. modeling ASHRAE Standard 62.1, importing GBXML files, and various system types).
- Interpret results and learn how to read the various output reports.
- Practice using the program through in-class exercises
- Interpret results and the various output reports

The class is designed primarily for beginning users, but advanced users will gain a better understanding of program methodology and garner tips from the trainer.

This class provides basic information critical for understanding subsequent C.D.S. TRACE courses (e.g. TRACE 700 Energy & Economics and the ASHRAE Standard 90.1/LEED Seminar).

Prerequisites: You must hold a valid license for the software. If you need to purchase software, take advantage of the [software and training discount](#).

We also request that you familiarize yourself with the software by completing the tutorials in the *Getting Started Guide* prior to attending class. Access the *Getting Started Guide* from within TRACE by selecting Help > Documentation > Getting Started.



TRACE 700 (CDS-TRNGL3)

TRACE 700 software is the benchmark complete load, system, energy and economic analysis program that compares the energy and economic impact of such building alternatives as architectural features, HVAC systems, building utilization or scheduling and economic options.

Trane C.D.S. provides a full day of training on TRACE Energy and Economics. By the end of this course, you will be able to:

- Navigate the program and gain a better understanding of the various input fields.
- Summarize how weather is used to determine peak and off-peak loads.
- Summarize the various daytypes TRACE™ uses to calculate peak and off-peak loads.
- Understand how TRACE™ uses unloading curves to determine energy use.
- Create multiple alternatives to model various choices.
- Create custom library values for cooling and heating equipment.
- Summarize how TRACE™ calculates life-cycle costs and other economic parameters.
- Create custom utility rate structures.
- Identify advanced features in the program to include modeling ASHRAE Standard 62.1, importing GBXML files, and system control strategies.
- Interpret results and learn how to read the various output reports.
- Practice using the program through in-class exercises
- Identify various resources available to help licensed users

The class is designed primarily for intermediate users. The information in this class provides basic information critical for understanding subsequent C.D.S. TRACE courses (e.g. the TRACE 700, LEED, and ASHRAE Standard 90.1 and the Advanced Topics courses).

Prerequisites: You must hold a valid license for the software. If you need to purchase software, take advantage of the [software and training discount](#).

Participants are expected to have previously attended TRACE Load Design training, and if not, to be a proficient TRACE Load user.



TRACE 700 Advanced Topics (CDS-TRNGL4)

In addition to the courses above, C.D.S. offers advanced TRACE 700 training. Please contact us if there is a specific topic you would like to cover. Topics may include the following, but they are dependent on customers' requirements:

- Daylighting
- ASHRAE 62.1 Inputs and Reports
- Airflow Balancing
- Interpreting Outputs
- Air to Air Energy Recovery
- Dedicated OA
- Creating Libraries- schedules, equipment, constructions, etc.
- TES – Thermal energy storage
- Over/under Sizing
- Heat Recovery Chillers
- Waterside Free Cooling
- Cogeneration
- Cooling Tower Operation and Design
- District Energy Modeling
- Life Cycle Cost Analysis
- Geothermal HP Systems
- Terminal Fan Sizing (Parallel and Series)
- Detailed Psychometrics
- Underfloor Air Distribution
- Variable Refrigerant Flow Systems
- Active and Passive Chilled Beams

and many more... just ask!

Prerequisites: You must hold a valid license for the software. If you need to purchase software, take advantage of the [software and training discount](#).

Participants are expected to have previously attended TRACE 700 Load and TRACE 700 Energy & Economics courses prior to attending this course. If not, those taking the course should understand how to perform basic functions such as navigation, creating templates, creating custom library values, program methodology, and how to interpret results



Platinum Training Package (PTP01)

Course Description

Trane University can provide pre-paid and packaged deals when sending one or more people to a class or several classes. The PLATINUM Training Package includes 47,500 credits to attend Trane University professional education courses to be used over the term of two years. The student selects their course offerings suited to their needs and takes the courses at their selected pace.

Training Packages

Trane University Training Packages are designed to help you save money when you send one or more people to a class or several classes. This program works by pre-paying for training credits, each credit is equivalent to one dollar, which can reduce your cost by up to 40%.

PLATINUM Training Package

- Includes 47,500 credits
- Platinum credits are valid for two years

Login to the Trane Education Center to purchase a training package.

We will contact you within 24 hours to provide your Package code, your credits can be applied immediately. For your convenience, we track the credits your company has used and send periodic updates showing your available credits.



Gold Training Package (GTP02)

Course Description

Trane University can provide pre-paid and packaged deals when sending one or more people to a class or several classes. The GOLD Training Package includes 7,600 credits to attend Trane University professional education courses to be used over the term of two years. The student selects their course offerings suited to their needs and takes the courses at their selected pace.

Training Packages

Trane University Training Packages are designed to help you save money when you send one or more people to a class or several classes. This program works by pre-paying for training credits, each credit is equivalent to one dollar, which can reduce your cost by up to 40%.

GOLD Training Package - Most Popular!

- Includes 7,600 credits
- Gold credits are valid for one year

Login to the Trane Education Center to purchase a training package.

We will contact you within 24 hours to provide your Package code, your credits can be applied immediately. For your convenience, we track the credits your company has used and send periodic updates showing your available credits.