

Agenda

Presented by Don Steeby

Air-Source Heat Pump Science and Technology

- Understanding the refrigeration cycle
- Principles of heat transfer
- How comfort is measured
- Understanding efficiency

Air-Source Heat Pump Efficiency, Economics and Operations

- Components and operation of heat pumps:
 - air-source, water-source and ground-source
- Heating operation in subfreezing conditions
- Integrating heat pumps with existing heating systems

System Sizing and Components

- Making heat loss calculations
- Sizing and locating of exterior and interior units
- Duct systems
- Refrigerant lines
- Wiring and controls

Mini-Split Systems

- How mini-splits differ from ducted systems
- Applications for mini-split systems
- Sizing and locating exterior and interior units

Integrating Heat Pumps with Other Energy-Efficiency Measures

- Heat pump economics
- Measuring performance
- Calculating savings and cost
- Integrating heat pumps with other HVAC systems

Heat Pump Case Studies

- New construction
- Existing buildings

Can't Attend? Order the Manual and Audio from the Live Seminar as a Self-Study Package!

Audio recordings of this seminar are available for purchase starting at \$279. See registration panel for more information and please refer to specific state licensing rules or certification requirements to determine if this learning method is eligible for continuing education credit.

Air-Source Heat Pumps for Energy Efficiency

Grand Rapids, MI - Wednesday, April 8, 2020



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Altoona, WI 54720-0278

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Learning Objectives

You'll be able to:

Describe heat transfer principles, the refrigeration cycle, indoor air comfort, and HVAC energy efficiency.

Distinguish air-source heat pumps from other types of heat pumps, and discuss heat pump performance in sub-freezing conditions.

Integrate heat pumps with existing heating systems.

Use heat loss calculations to size air-source heat pumps.

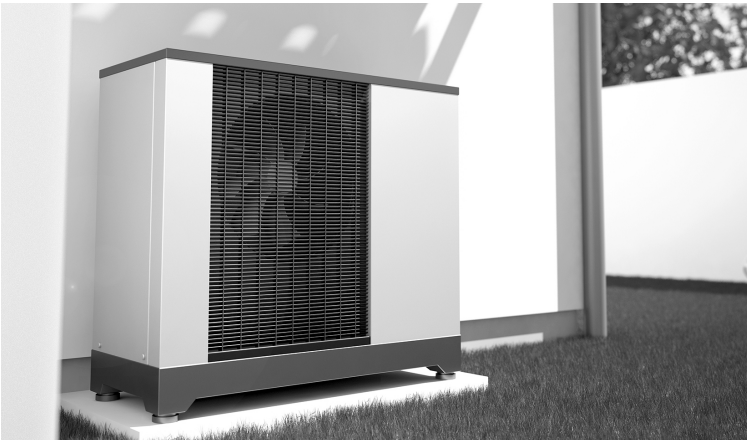
Differentiate mini-split systems from ducted systems and explore applications for mini-splits.



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Air-Source Heat Pumps for Energy Efficiency

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Learn about air-source heat pump science and technology

Explore air-source heat pump efficiency, economics and operations

Discuss sizing and locating of exterior and interior units

Examine how mini-split systems differ from ducted systems

Integrate heat pumps with other energy-efficiency measures

Review heat pump case studies

Continuing Education Credits

Professional Engineers
7.0 Continuing Ed. Hours

International Code Council
.7 CEUs (Energy)

Architects
7.0 HSW Continuing Ed. Hours
7.0 AIA LU|HSW

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Faculty

Don Steeby *Professor at Grand Rapids Community College*

Mr. Steeby is a professor of Heating, Air Conditioning and Refrigeration at Grand Rapids Community College. He has taught full time with GRCC since 2007. He has also taught as an adjunct professor for Ferris State University in Construction Management. He received his bachelor of science degree in HVAC/R Applied Technology from Ferris State University, and his master’s degree in Career and Technical Education also from Ferris State University.

Mr. Steeby has worked in the HVAC field since 1985. He has held positions in many areas of the industry including installation, service, sales, and project management. Mr. Steeby has worked for a local manufacturer of HVAC equipment for over five years, and he was employed by Honeywell for 11 years.

He holds a mechanical contractor’s license with the State of Michigan, and he has several nationally-recognized certifications including installation and service of geothermal equipment with North American Technician Excellence (NATE). He is also a certified trainer and installer of geothermal heat pumps through the International Ground Source Heat Pump Association (IGSHPA). Mr. Steeby has been actively involved in the geothermal industry for many years including writing software to size loop links and working on several commercial geothermal installations. In 2011, he published his book *Alternative Energy – Sources and Systems* through Cengage Learning which includes chapters on geothermal systems.

Seminar Information

Courtyard by Marriott Downtown
11 Monroe Ave. NW
Grand Rapids, MI 49503
(616) 242-6000

Tuition
\$299 for individual registration
\$279 for three or more registrations.

Included with your registration: Complimentary continental breakfast and printed seminar manual.

Receive a reduced tuition rate of \$101 by registering to be our on-site coordinator for the day. For availability and job description, please visit www.halfmoonseminars.org.

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar or the self-study package. You may also send another person to take your place.

Continuing Education Credit Information

This seminar is open to the public and offers 7.0 continuing education hours to professional engineers and 7.0 HSW continuing education hours to architects in all states. Educators and courses are not subject to pre-approval in Michigan.

This course has been approved by the American Institute of Architects Continuing Education System for 7.0 LU|HSW (Provider No. J885). Visit www.halfmoonseminars.org to view complete AIA/CES information under this course listing. Only full attendance is reportable to the AIA/CES.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700), North Carolina, and North Dakota. HalfMoon Education is deemed an approved continuing education sponsor for New York engineers and architects.

The International Code Council has approved this event for .7 CEUs in the specialty area of Energy (Preferred Provider No. 1232).

This seminar offers contractors a non-credit continuing education opportunity. It has not been submitted to any state contractor licensing entity for continuing education approval. Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Additional Learning

Webinar Series

Foundation Damage and Repair

- **Design & Geo-Environmental Loading, Building Codes, Soil Properties**
Wed., March 4, 2020, 11:00 AM - 12:30 PM CST
- **Foundation-Slab-Wall Design and Construction**
Wed., March 4, 2020, 1:00 - 2:30 PM CST
- **Evaluation of Foundation-Slab Damage and Repair Alternatives**
Thurs., March 5, 2020, 11:00 AM - 12:30 PM CST
- **Evaluation of Foundation Wall Damage and Repair Alternatives**
Thurs., March 5, 2020, 1:00 - 2:30 PM CST

Solar Photovoltaic Project Design and Development

- **Solar Photovoltaic Project Design and Development, Part I**
Wed., March 4, 2020, 11:00 AM - 2:15 PM CST
- **Solar Photovoltaic Project Design and Development, Part II**
Thurs., March 5, 2020, 11:00 AM - 2:15 PM CST

International Residential Code

- **Development and Enforcement of International Residential Code**
Thurs., March 12, 2020, 11:00 AM - 12:00 PM CDT
- **IRC Building Planning and Shell Construction, Part I**
Thurs., March 12, 2020, 1:00 - 2:30 PM CDT
- **IRC Building Planning and Shell Construction, Part II**
Fri., March 13, 2020, 11:00 AM - 12:30 PM CDT
- **IRC Energy Efficiency and Building Systems**
Fri., March 13, 2020, 1:00 - 3:00 PM CDT

For more information and other online learning opportunities visit:
www.halfmoonseminars.org/webinars/

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Registration

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How to Register		Registrant Information	
Online: www.halfmoonseminars.org		Name: _____	
Phone: 715-835-5900		Company/Firm: _____	
Fax: 715-835-6066		Address: _____	
Code:		City:_____ State: _____ Zip:_____	
Mail: HalfMoon Education Inc., PO Box 278, Altoona, WI 54720-0278		Occupation: _____	
Complete the entire form. Attach duplicates if necessary.		Email: _____	
		Phone: _____	
		Additional Registrants:	
		Name: _____	
		Occupation: _____	
		Email: _____	
		Phone: _____	
		Name: _____	
		Occupation: _____	
		Email: _____	
		Phone: _____	
		Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred.	
		() I need special accommodations. Please contact me.	

Tuition	
() I will be attending the live seminar. Single Registrant - \$299.00 . Three or more registrants from the same company registering at the same time - \$279.00 each.	
() I am not attending. Please send me the self-study package:	
☐ Downloadable MP3 Audio/PDF Manual for \$279.00 .	
☐ CD/Manual Package for \$299.00 . ☐ USB/Manual Package \$299.00 .	
(S&H included. Please allow five weeks from seminar date for delivery)	
Checks: Make payable to HalfMoon Education Inc.	
Credit Card: Mastercard, Visa, American Express, or Discover	
Credit Card Number: _____	
Expiration Date: _____ CVV2 Code: _____	
Cardholder Name: _____	
Billing Address: _____	
City:_____ State:_____ Zip: _____	
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Email: _____	