AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR CONDITIONING ENGINEERS, INC.

the Champ

Monthly Newsletter of the
CHAMPLAIN VALLEY CHAPTER OF ASHRAE
Serving Vermont Since 1969

April 2011 — 1 — Vol.25 No.9

President's Message

Well spring is finally here. I hope all have had time to enjoy some of the nice weather we have been having. Our April meeting at Vermont Technical College turned out great again this year. It was nice to see a total of 43 people attend the meeting in Randolph even though many had a long distance to travel. It is great to see the support for the VTC students.

I want to thank VTC and the students for hosting April's meeting. The students did a great job again this year presenting on their HVAC design of the Drake Well Museum located in Titusville, PA. The students will be submitting this design for the 2011 ASHRAE Student Design Competition.

The 2011-12 Officers and Board of Governors were voted in during April's meeting. Thanks to Dick Wilcox for making the motion to approve the nominees and big thanks to the 2011 Nominating Committee for their time and efforts in putting together another great team for next year.

The 2011-12 Officers and BOG are as follows:

President - Mike Cook
President Elect - Tom Dacres
Vice President - Nathan Mascolino
Treasurer - Ken Secor
Secretary - Rob Favali
BOG - Peter Bailey
BOG - Dick Wilcox
BOG - Shawn LaBelle
BOG - Gretchen Langfeldt
BOG - Rachel Mascolino

I want to Congratulate the recipients of our 2011 VTC ASHRAE Award and 2011 Past President Memorial Scholarship. The awards and scholarship will be presented to the students during VTC's Award Ceremony on Thursday April 14th @ 6pm.

continued on page 3

May 4th @ Heritage Flight & Hampton Inn

5:30 PM SHARP Tour of the Heritage Flight Building on Aviation Drive *(Everyone is to meet at Heritage Flight's parking lot / For Directions: http://bit.ly/dPDSrk)*

Dinner 7 PM @ The Hampton Inn

Main Presentation 8 PM: A panel of (4) participants will give a summary overview of their role in the design/ construction of the project

Meeting Cost
$30 CVC / $35 Non-Members
RSVP to Ray Hickey by Friday 04/29/11
(Please let him know if you are RSVP-ing for the tour and dinner)

contents

chapter reports

2010-2011 ASHRAE CVC MEETING CALENDAR

September 1st	October 6th	November 3rd	December 8th	January 5th
The Essex	**The Essex**	**The Essex**	**Hampton Inn**	**Hampton Inn**
BOG Meeting - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm HVAC Seismic Restraints Part 1 - Codes and Standards Part 2 - Applications Steve Fey - Mason Industries	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Tech Session - Chilled Beams / Krueger Main Presentation - Vermont Commercial Building Energy Code Tim Guiterman, Navigant Consulting	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Membership Promotion and Joint Meeting with Vermont Green Building Network (VGBN) USGBC - Lisa Whited - LEED Accreditation, Training & Maintenance	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Joint Meeting with RSES **Speakers** Jerry Kelman (Rawal – APR Control Devices) Walt Joncas (Hy-Save Technology – refrigeration pumping)
February 9th	**March 2nd**	**April 6th**	**May 4th**	**June 1st**
Hampton Inn	**Hampton Inn**	**Judd Gym at Vermont Technical College**	**Heritage Flight / Hampton Inn**	**End of Year Special**
BOG Meeting - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm **ASHRAE Distinguished Lecturer** Chris Mathis presenting on: 1. Energy Efficient Window & Fenestration Technologies 2. How Long Will It Last? – Addressing the Challenge of Sustainability	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Presentations 1. John Morris of Motivair -Chiller water applications for data centers and critical environments 2. Michael Hayes of Smardt - Magnetic levitated chiller compressor technology	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm ASHRAE Hot Topic Webinar: ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, Standard for the Design of High Performance Green Buildings. **Dinner** - 7:00 pm **Presentation - 8:00pm** ASHRAE Student Design Project, Drake Well Museum located in Titusville, PA Meeting Sponsored by Vermont Technical College (VTC) Student Chapter	**BOG meeting -** 4:15pm at Vermont Mechanical **Site Tour** - 5:30pm Tour of the Heritage Flight Building on Aviation Drive (Everyone is to meet at 5:30pm SHARP in Heritage Flight's parking lot) **Dinner** - 7:00 pm At the Hampton Inn **Presentation** - 8:00 pm A panel of (4) participants will give a summary overview of their role in the design/construction of the project	Location and Topic TBD

The recipients are as follows:

Stephen Smith-	VTC ASHRAE Award $250
Dan Aubin-	VTC ASHRAE Award $250
Erin Fajans-	Past President's Memorial Scholarship $2,500

I hope to see all of you at our next meeting on Wednesday May 4th. This will consist of a tour of the Heritage Flight building on Aviation Drive South Burlington. We will meet in their parking lot at 5:30pm SHARP. So please get their early so we can get any security issues taken care of prior to the start of the tour. We will then all head back to The Hampton for dinner at 7pm, following with a presentation from 4 participants in the project. They will give a summary overview of their role in the design construction of the project. The (4) participants will be Richard Deane, AIA from Truex Cullins Architects, Bill Fyfe, PE of Hallam Associates, Glenn Thomas, PE commissioning agent from Thomas Engineering Associates and Jay Myrto or Will White from Alteris Renewables. Please RSVP to Ray Hickey by Friday April 29th, and let him know if you will be attending the tour and dinner.

Sincerely,
Shawn LaBelle
Chapter President

April Meeting Photos

VTC Hosts the April meeting for the 3rd year in a row


Presentation


Conor McManus VTC Student


Catherine Dumont VTC Student

Technology Transfer

I would like to take this opportunity to thank the ASHRAE members who attended last month's meeting. Thank you to Chris Reilly and the VTC ASHRAE student chapter for hosting April's ASHRAE meeting. Our appreciation goes out to Conor McManus, Catherine Dumont, and Dustin Cressman for their presentation on the Drake Well Museum project in Titusville, Pa. which they will be submitting for the ASHRAE student design competition. Good Luck!

May's program will be a site tour of the Heritage Flight building on Aviation Drive near the Burlington International Airport. The facility recently received USGBC LEED Gold certification. This is a secure facility so we will be chaperoned by a Heritage Flight employee and not all areas of the building will be accessible to us. We will meet in Heritage Flight's parking lot at 5:30 PM sharp.

After completion of the tour we will travel to the Hampton Inn for dinner and social gathering starting at 6:30 PM. After dinner a panel of four (4) participants in the project will give a summary overview of their role in the design/construction of the project followed by a question and answer period with the audience. As we tour the facility please make a mental note of any questions you might want answered during the panel discussion. Special thanks to Bill Fyfe of Hallam Associates for helping to coordinate and schedule this tour.

Heritage Flight is a 79,000 sq. ft. state of the art fixed base operations (FBO) facility serving the needs of the general aviation community at Burlington International Airport. Heritage flight provides private air charter, aircraft maintenance and management services from their new LEED Gold certified facility. The building itself was recycled from the skeleton of a 1954 Army National Guard hanger and was transformed into an environmental friendly and welcoming facility for pilots and passengers. The building features one of the largest green roofs in New England where rainwater is collected in a 30,000 gallon tank. The collected rainwater is then recycled for washing airplanes and plant irrigation. The facility's parking lot is constructed of pervious pavement so rainwater is absorbed into the ground as an alternative to discharging to the municipal storm water system. The hanger utilizes day lighting to illuminate its white painted hanger during the day. The building's renewable energy strategy is centered on a community scaled 100 KW wind turbine the first of its kind installed at a U.S. regional airport supplemented with solar photovoltaic panels. The wind turbine and PV panels are expected to provide an annual 400,000 kilo-watt hour savings for the facility. The office area is conditioned using packaged VAV rooftop units with reheat coils and perimeter baseboard radiation. The building plumbing system utilizes a solar hot water heater.

Our discussion panel for the evening will include Richard Deane, AIA from Truex Cullins Architects, Bill Fyfe, PE of Hallam Associates, Glenn Thomas, PE commissioning agent from Thomas Engineering Associates and Jay Myrto or Will White from Alteris Renewables.

A reminder to members planning on attending May's tour and meeting to RSVP to Ray Hickey, rhickey@advancedcomfortsys.com by April 29 for body count.

BOG Meeting Minutes

Mar. 25th, 2011 BOG Meeting Minutes

Date:	3/25/11
Location:	Trader Dukes
Time Called to Order:	12:11pm
Called to Order By:	Shawn LaBelle, President.
Minutes Recorded By:	Nathan Mascolino, Secretary

ATTENDANTS

Shawn LaBelle	Vermont Mechanical
Mike Cook	ARC Mechanical
Scott Alexander	LN Consulting
Ken Secor	KPS Consulting
Tom Dacres	VHV
Nathan Mascolino	VHV
Sandy Laflamme	Efficiency Vermont

LAST MEETING MINUTES

Motion to approve Feb, 2011 meeting minutes was put forth by Mike C and seconded by Sandy L, motion passed.

OFFICER REPORTS

President Report/Chapter Operations: Shawn Labelle

Shawn reported that no new nominations had been made for officers. The new BOG officers will be voted on, and announced in the chapter meeting.

Shawn reported that he has received 11 of 22 checks for this years advertising. He will contact the companies that have not yet paid and give an update in the next meeting

Shawn announced that VTC had selected two people to receive the VTC ASHRAE award. The two students are Dan Aubin, and Stephen Smith. They will be announced in the chapter meeting.

Shawn reported that to date he had only received one application for the past presidents award. The application was from Erin Fajans, and if no other applications are received she will be awarded the scholarship. Shawn will announce at the chapter meeting.

Mike Cook will attend the President Elect Training seminar.

Ken S volunteered to take photos at the chapter meetings, and supply them to the newsletter editor.

The webinar is all set for the chapter meeting at VTC. The registration has been filled out and Shawn reported that he will arrive early at VTC to get the necessary equipment set up.

Discussion was opened up regarding next years meeting topics. A suggestion was made that the surveys from the chapter be reviewed, and next years topics be selected having to do with application, and more design. The topic was tabled for the next meeting.

Shawn reminded everyone to update their PAOE points.

An email motion was made by Ken S (quoted below) to not seek reimbursement from the student chapter for the money they spent on the trip to the ASHRAE winter meeting, motion was seconded by Peter B (Via Email) and an email vote took place. Motion passed.

1. We forgive the students and advisors of VTC any personal responsibility for spending any portion of our donation for purposes not intended.
2. We will continue to financially support student and staff activities on an “as needed” basis with consent for such appropriations being a function of the CVC-ASHRAE BOG.
3. All future aid or donations shall be considered with this mishap in mind - along with enough specificity to assure the funds are used only for the intended purpose in the future.

President Elect: Mike Cook

Mike reported that the April meeting will be at VTC

Mike reported that the May meeting will be a facility tour of the Heritage flight. The tour will start at 5:30. Dinner will be served at the Hampton after the tour and a panel of people involved in the project will be available for a Q & A

Mike reported the June meeting is still open to

discussion. The topic was tabled. Peter B was not in attendance, and information about a possible BBQ needed to be reviewed with him.

Vice President/MembershipChair Report: Tom Dacres

Tom had nothing to report.

Treasurer Report: Ken Secor

Ken's full monthly report will appear in the newsletter.

Ken announced that he would likely not continue as the treasurer for the ASHRAE 2012-2013 year. Discussion was opened regarding some new treasure training over the next year.

Secretary Report: Nathan Mascolino

Nathan had nothing to report.

Resource Promotion: Sandy Laflamme

Sandy had nothing to report.

History: Gretchen Langfeldt

Gretchen was not in attendance.

Reception: Ray Hickey

Ray had nothing to report.

Refrigeration: Peter Bailey

Peter was not in attendance.

NEW BUSINESS

No new business.

MEETING ADJOURNED

Motion to adjourn made by Ken S, seconded by Scott.
Meeting adjourned @ 1:18 PM

These minutes are the writers understanding of the discussions involved. If there are any exceptions taken, or omissions, please notify the writer immediately.

General Meeting Minutes

Date:	4/6/11
Location:	VTC
Minutes Recorded by:	Nathan Mascolino, Secretary
Attendance:	35

ATTENDANTS

Scott Alexander	LN Consulting
James Ashley	Green Mountain Geothermal
Ben Basiliere	Vermont Heating & Ventilating
Phil Bresnahan	Vermont Mechanical Inc.
Mike Cook	ARC Mechanical
Tom Dacres	Vermont Heating & Ventilating
Rob Favali	Dubois & King
Jonathan Jordan	Advanced Comfort Systems
Brice Kosnik	Basix Automatiom Integrators
Shawn LaBelle	Vermont Mechanical
Jim LaVallee	Vermont Mechanical
Nathan Masoclino	Vermont Heating & Ventilating
Chris Reilly	VTC Faculty
Ken Secor	KPS Consulting
Harris Unger	Advanced Comfort Systems
Wayne Vanasse	ARC Mechanical
Dick Wilcox	Vermont Heating & Ventilating
Scott Sabol	VTC Faculty
Brad Miller	VTC Faculty
Terry Murphy	VTC Faculty
Barbara	VTC Faculty
Ward Joyce	VTC Faculty
Erin Fajans	Student
Justin Houghten	Student
Brian Smith	Student
Iris Davis	Student
Jason Ngai	Student
Kristen Gulrajani	Student
Sam Rosen	Student
Stephen Smith	Student
Tony Giompa	Student
Guen St. Sauveur	Student
Dayton Brown	Student
Elizabeth Aluxek	Student
Patrick Deyette	Student

GENERAL MEETING

TECH SESSION:
An ASHRAE webinar was shown on the topic of the new

ASHRAE standard 189.1. A bit of technical difficulty early on was figured out, and the webinar played through without problem.

Shawn announced the recipients of the ASHRAE scholarships this year.

- The Past president Memorial scholarship was awarded to Erin Fajans
- The VTC ASHRAE award was given to Dan Aubin, and Stephen Smith

During the break between speakers Dick W read the nominations for the officer positions next year. The new officers were officially voted in.

President	Mike Cook
President Elect	Tom Dacres
Vice President	Nathan Mascolino
Treasurer	Ken Secor
Secretary	Rob Favali
BOG	Peter Bailey
BOG	Dick Wilcox
BOG	Shawn LaBelle
BOG	Gretchen Langfeldt
BOG	Rachael Mascolino

Nominations are open for one month. Officers will be voted in during the Apr meeting.

Peter Bailey gave an award to Mary Jane from Efficiency Vermont for her work on the project that the CVC ASHRAE chapter submitted for (and won) the comfort cooling award.

MAIN PRESENTATION:

The VTC student chapter presented their ASHRAE student design project, and fielded questions.

VTC provided a nice facility and served a fine meal.

These minutes are the writers understanding of the discussions involved. If there are any exceptions taken, or omissions, please notify the writer immediately.

Treasurer's Report

As of today, April 13, 2011, all bills are paid and our TD Bank checking account balance is $13,190 - down from last month by $3,140.

The reason for the large balance drop? We paid out $3,000 in scholarships alone! A special thanks to VTC for hosting March's meeting as well as the "Webinar" - and project presentations made by students after the meal.

Ken Secor, Treasurer

Resource Promotion

By Sandy LaFlamme

A special thank you to James Moore, Bill Root, the Vermont Licensed Plumbers Association (VLPA), and General Electric Foundation – Matching Gifts Fund, for recent donations to Research Promotion. Thanks to your generosity, our total amount raised has increased by $550 to $5,426. We appreciate your show of support for ASHRAE Research, thank you!

If you haven't donated yet, and would like to, please check out our RP webpage which has a link to online donating. Please be sure to contact me with things you'd like to see on the site, and I will try to include your recommendations. You can get to our Chapter's RP web page by going to www.ashraevt.com and clicking on the Resource Promotion link in the column on the left side of the home page.

You're still welcome to donate by mailing a check, as well, of course. Please make your check payable to ASHRAE Research Promotion and mail it either to ASHRAE Research Promotion, 1791 Tullie Circle, Atlanta, GA 30329 or to Sandra LaFlamme, Efficiency Vermont, 255 South Champlain Street, Burlington, VT 05401. Our Chapter gets credit for your donation regardless of your method of donating.

Student Activities Report

VTC Chapter
Committee Chair: Shawn LaBelle
Student Chapter Advisor: Chris Reilly

First I want to thank Vermont Technical College and the students for hosting our April meeting again. This has made it the third year in a row that the college has hosted our April Meeting. All three years we have had a turnout greater than 40 people, that is great.

Conor McManus, Catherine Dumont, and Dustin Cressman did a great job presenting on their HVAC design to be submitted for the 2011 ASHRAE Student Design Competition. This year's design is of Drake Well Museum located in Titusville, PA.

I want to congratulate Stephen Smith and Dan Aubin, they are the recipients of the 2011 VTC ASHRAE Award. They both will be receiving a check in the amount of $250. I also want to congratulate Erin Fajans who is our recipient for the 2011 ASHRAE Champlain Valley Past President Memorial Scholarship. She will be receiving a check for the amount of $2,500. The awards and checks will be presented to the students during the VTC Awards Ceremony on Thursday April 14th at 6pm.

The scholarship money is funded by all the proceeds from our newsletter advertisement. So a big thanks goes out to all who paid for a advertisement in the newsletter this year.

Thanks!
Shawn LaBelle

VTC ASHRAE Student Chapter 2010-2011

Refrigeration EEV - Part 2

Last month in Part 1 of this feature, Dave Demma, CM, covered some key elements to ensure that a refrigeration (or air-conditioning) system operates at peak efficiency, including: maintaining the suction-line pressure drop at an absolute minimum; setting all of the system parameters to those specified by the design criteria (commissioning); and scheduling thorough maintenance regularly so heat-transfer surfaces are clean of debris. He also discussed the role of a TEV and the effects of high superheat.

Now, the conclusion explains the differences between a TEV and EEV within a system

The EEV's ability to repeatedly a provide constant amount of superheat, with minimal variation, at the outlet of the evaporator allows a system to maintain maximum efficiency and consistency in performance

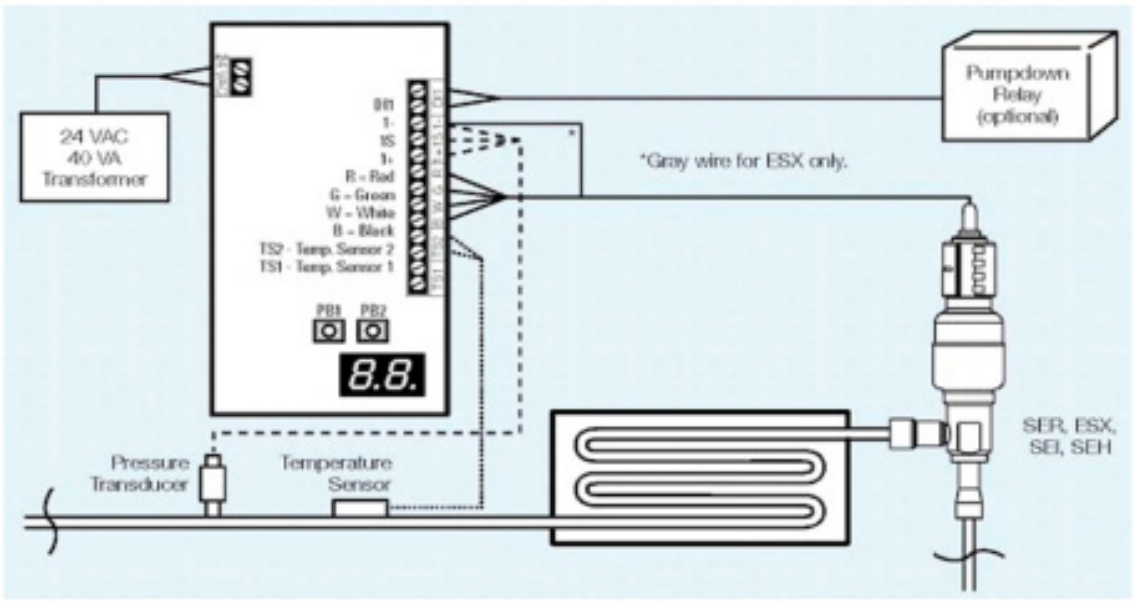


Figure 1
This illustration shows a very common EEV application where liquid refrigerant is supplied to the in let of the EEV in the same manner that it would be supplied to a mechanical TEV.

What is it about the EEV that makes it a superior choice for consistent superheat control? When looking at a very common EEV application (see Figure 1), liquid refrigerant is supplied to the inlet of the EEV in the same manner that it would be supplied to a mechanical TEV. In a mechanical TEV, it is the force balance between the refrigerant charge in the sensing bulb (acting against the top of the element diaphragm) versus the sum of the evaporator pressure plus the adjustment spring pressure (acting against the bottom of the element diaphragm) that determines what percentage of the valve port is open.

As the system conditions change, the sensing-bulb temperature and evaporator pressure will change, causing a change in the force balance, resulting in a new valve opening percentage. Given the limitations of mechanical operation due to hysteresis of the element diaphragm and adjustment spring, there can frequently be a fair amount of delay and/or overshoot as the valve position changes in response to the conditions. It is because of this that the mechanical TEV cannot be expected to operate at a low superheat without some variation. Therefore, its setpoint will typically be set high enough to ensure that the expected variation will not result in a floodback condition.

In addition, the typical mechanical TEV can operate reasonably well down to approximately 40%–50% of its rated capacity (25% for a balanced ported mechanical TEV). This will prove to be a limiting factor in year-round applications where lowering the head pressure in the colder ambient temperatures of spring/fall/winter can offer more efficient operation and lower energy consumption.

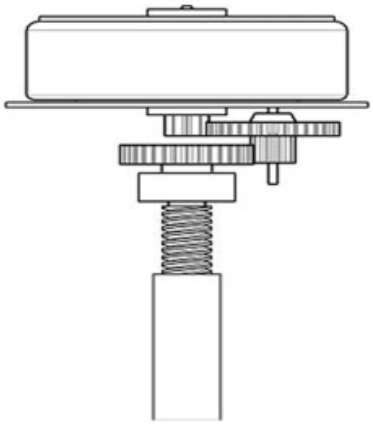


Figure 2
This illustration shows a step motor with gear train.

Effective EEVs

The most effective variety of EEVs utilize a step motor to drive the valve open or closed (see Figure 2). Unlike common induction or commutated motors that are designed to rotate continuously, a step motor has the ability to rotate a small fraction of a revolution as it receives the step signal sent by its controller. As applied in EEVs, the step motor transforms its rotation into linear movement by employing a digital linear actuator—a simple gear train that then turns a threaded shaft, accomplishing valve opening/closing. An added benefit of a DLA is the available increased linear force required to close the valve's piston against the typical pressure differential present across the valve's port.

While the EEV is a state-of-the-art valve and has the potential to provide a much more stable superheat than its mechanical counterpart, it only op¬erates in response to the control¬ler's signal. In a sense it is a "stupid" component, because it requires a controller outfitted with a well-conceived algorithm (program) that has been properly fine-tuned in the field for its particular application (well, a state-of-the-art Ferrari will not win any races with an inexperienced bum behind the wheel). It is all about the expertise and experience of the people creating the algorithm, and the field personnel's ability to fine-tune the adjustable parameters.

Given that the function of an expansion valve is to maintain superheat at the evaporator outlet, temperature and pressure data from that location is supplied to the EEV con¬troller via a temperature sensor and pressure transducer. The controller is outfitted with a sophisticated PID— or proportional, integral, derivative— algorithm that has been designed to calculate the superheat from the temperature and pressure data supplied to it, and then drive the step motor to the position required to maintain the superheat setpoint. Without going into a lot of technical jargon to describe the function of the PID, it can be simply stated as this:

The P function is to allow the controller to change the output (valve position) in proportion to the input (superheat). The I function will sense the average deviation from the setpoint and apply an offset to com¬pensate for this deviation (which is continually changing in response to the system load and system condition changes). And the D function will sense the superheat's rate of change, and uses this to attempt a

prediction of future valve position.

It is this complex set of instructions that will constantly monitor the superheat, and drive the EEV open or closed in either small or large increments, to meet the constantly changing conditions that any HVACR system might see. For example, a large-tonnage EEV applied on a chiller would have approximately 6,400 steps in its stroke, from fully open to fully closed. That is a linear distance of .0000783 in. per step of resolution. Couple this minute amount of change in valve stroke with the instantaneous nature of digital control, and it is easy to see how the EEV can offer superior control over its mechanical.

EEV versus TEV

Another benefit of the EEV (when compared to the mechanical TEV) is its ability to operate at a very low percentage of its rated capacity. While most air-conditioning applications typically operate only during warmer months of the year, refrigeration equipment will operate year-round. As was discussed in Part 1, lowering the compression ratio will result in a significant increase in compressor capacity. Additionally lowering the pressure that the compressor pistons must operate against (discharge pressure) will yield a lower motor amp draw, further increasing the compressor efficiency.

Figure 3 illustrates the drastic improvements in compressor capacity and motor amperage for a Copeland 3DRHA-100ETFC compressor by taking advantage of the natural lower-ambient temperatures during the colder months, and lowering the condensing temperature to 70°F. As such, it makes sense to take advantage of the lower ambient temperatures during the spring/fall/winter months and allow the equipment to operate at reduced discharge pressures.

Comparative Compressor Performance Data			
Saturated Suction Temp (°F)	Saturated Condensing Temp (°F)	Current Amps	Compressor Capacity (Btuh)
-20	105	28.4	50,500
-20	70	25.0	66,500

Figure 3

There are three conditions that will determine the expansion-valve capacity (EEV or mechanical TEV): temperature of the liquid refrigerant entering the expansion valve, saturation temperature of the refrigerant in the evaporator and pressure drop across the expansion-valve port. It is quite common for the typical supermarket multiplex rack to utilize a subcooler to maintain the liquid refrigerant at a constant temperature year-round

It also is common to see some form of suction-line regulator, which will keep the evaporator saturation temperature fairly constant. This leaves the pressure drop across the expansion-valve port as the only condition that might vary during the course of the year. The pressure drop across the expansion-valve is directly influenced by the discharge pressure, so the expansion-valve capacity will increase or decrease as the discharge pressure increases or decreases.

Comparative Expansion Valve Capacities at Varying Condensing Temperatures						
Evaporator Temperature (°F)	Condensing Temperature (°F)	Liquid Temperature (°F)	ΔP Across Expansion Valve Port	Expansion Valve Nominal Capacity (Btuh)	Expansion Valve Actual Capacity (Btuh)	% of Rated Capacity Required
-20	105	50	202	1	20,732	82%
-20	60	50	75	1	12,593	135%
-20	40	50	45	1	10,366	164%

Figure 4

Some compressor manufacturers have approved applications of their products down to condensing temperatures as low as 40°F. While this offers peak compressor efficiency and very low motor-amperage draw, the resulting pressure drop across the expansion valve at this condition is quite low—so low that an expansion valve sized correctly for the summer ambient condition will have insufficient capacity to meet the evaporator load in the reduced ambient condition (see Figure 4 for a 17,000-Btuh application). A seemingly simple solution would be to oversize the expansion valve so that there would be sufficient capacity year-round, but the limitations of the mechanical TEV, and the fact that it can only operate down to approximately 40% of its rated capacity, prevent this possibility. Over sizing the expansion valve to provide sufficient reduced ambient capacity would result in flood-back problems during the summer months.

With the EEV's ability to precisely control superheat down to approximately 10% of its rated capacity, it can readily be oversized to provide the needed capacity at the reduced ambient condition, and still maintain consistent superheat during the summer months when the valve capacity is much greater than the evaporator load.

The EEV has been available for use in systems since the early 1990s. It is proven and reliable, and offers the most stable and consistent control of the superheat at the outlet of the evaporator. This allows any air-conditioning or refrigeration system to operate at peak efficiency—one major bene¬fit of the EEV. Another is the simplicity in setting it. Rather than the countless hours spent setting more than 100 mechanical TEVs used in the typical supermarket application of yesteryear, that labor can be reduced to a few minutes per valve, as the superheat setpoint is easily entered into the controller. Add to those benefits the fact that the EEV can realistically allow the system to operate at the lowest possible con¬densing temperature approved by the compressor manufacturer, and there is no reason to consider using a mechanical TEV again.

When Is the Grass Really "Greener"?

By Amy K.C. Patenaude, P.E., Peter Adamczyk, and Amy Rubin of Vermont Energy Investment Corporation

How does a property owner know when "going green" is a good financial move? Gone are the days when the economic and environmental benefits of energy efficiency, renewables, and conservation were largely unknown or dismissed as insufficient to justify going the extra mile -- and dollar. Today, interest in green buildings, equipment, and services is sufficiently strong to warrant our taking a moment to ask: Are all green projects created financially equal? Do they always put more green in an owner's pocket?

The answer is no. Some green projects have higher rates of return than others and, while some property owners will see dramatic financial benefits from taking a green approach in their existing or proposed buildings, others will get a greater return by investing their money elsewhere. The reason to be aware of the custom nature of green investments is not to cause owners to hesitate to consider these approaches. To the contrary, the potentially

substantial gains from green investments give us all good reason to consider them, but in a comprehensive way.

When weighing the benefits of green investments, some property owners place a high value on such matters as pollution prevention or lowering dependence on foreign oil. Although these can be powerful factors in decisions to go green, they are not the focus of this article. This discussion will center on financial elements of individual investments.

The cost effectiveness of green investments depends on a range of characteristics that are particular to each property (building size, hours of use, nature of use, condition / size / age / placement of equipment, etc.), as well as incremental project costs, expected energy savings, the owner's budgeting priorities, available capital, cost of financing, current and anticipated energy prices, inflation, compared returns from other investment opportunities, and more. With an understanding of all the factors that influence an investment's cost effectiveness, property owners can confidently identify investments that will provide the best return.

To compare green investments to traditional investments, it's important to understand that they differ in two ways:

1. The return on investment (ROI) for green investments consists of savings in resource costs. These savings are the money that is NOT spent on energy, water, and / or other resources as a result of a green investment.
2. In a traditional investment, the ROI typically includes some end value of the original investment, such as income from the sale of an asset or the maturity of a bond. In a green investment, the initial investment is spent and all ROI comes from resource savings. Because these savings can be substantial, green investments often compare quite favorably to traditional investments.

In addition to resource savings, other benefits from green approaches can have a positive monetary impact. For example, the greater comfort and improved ambience provided in green buildings are linked to increased retail sales and customer loyalty, as well as higher worker morale and productivity. Sales also may be tied to consumer interest in buying from green businesses. Green buildings also can have a higher value and greater longevity.

How can owners determine if green investments are right for their properties? The first step is to work with a contractor or design professional to identify resource-saving opportunities, to help determine the most feasible efficiency / renewable approaches, and to discuss financial considerations.

If financing an energy-efficiency project, an owner may be able to acquire a loan with payments that are lower than energy savings, resulting in a positive cash flow. Case in point: A Vermont commercial property owner recently created a positive cash flow of an expected $1,300 to $1,600 per month while paying down a 5-year $224,000 loan for an energy-saving project. After the loan is paid off, the positive cash flow is anticipated to rise to more than $5,000 per month and to continue to increase. Ten years after the initial investment, the net cumulative cash flow is expected to top $380,000. This cash flow factors in the owner's initial contribution to the project, loan principal and interest payments, ordinary operation and maintenance expenses, as well as new non-electric energy costs connected to the project. These costs are outweighed by electricity savings as well as relatively minor reductions in operation and maintenance expenses.

If a project is financed with a fixed-rate loan, the property owner's savings / ROI may be higher than originally calculated, due to rising energy costs. While an owner can't know what future energy prices will be, he or she will be shielded from a portion of higher costs because of reduced energy use.

Funding for energy-saving projects may be available from a variety of sources, including utility ratepayer - or taxpayer - funded government incentive programs (including tax breaks), private investors in such financial vehicles as leasing, and financial institutions issuing low-interest loans. Providers of financial incentives use various qualification criteria. Some programs provide incentives for approaches that meet or exceed specific standards for energy savings. Other programs only provide incentives for projects that are cost effective. This cost effectiveness may be defined as beneficial to the individual property owner and / or to a defined group – such as all utility customers in a given territory – who will benefit from avoided rate increases and avoided power-generation pollution.

It's clear that green investments' potential benefits justify their consideration in our properties. Equally clear is that each project is unique, as is each property owner's priorities and financial situation.With knowledge, and by taking advantage of expertise among design professionals and contractors, property owners can make informed decisions about investments that make solid financial sense.

More information about the financial considerations of green investments can be found in the "Financing Guidebook for Energy Efficiency Program Sponsors" at:

www.energystar.gov/ia/home_improvement/downloads/FinancingGuidebook.pdf

History

Hi Everyone! If anybody has any pictures from ASHRAE events these past two years please forward them to me at glangfel@hotmail.com so I can add them to the Chapter archives.

Speaking of archives, I thought we could all use a little reminder of how ASHRAE was founded. Here is a brief timeline summarizing the development of the Society:

January 24, 1895:

The American Society of Heating and Ventilating Engineers incorporated in the state of New York. The initiation fee was $15 with an additional $10 in annual dues.

December 4, 1904:

The American Society of Refrigerating Engineers was founded. Each member paid a $5 initiation fee and $10 for annual dues.

1954:

ASHVE changes its name to the American Society of Heating and Air-Conditioning Engineers in response to the increasing use of air-conditioning over the previous few decades.

January 29, 1959:

The American Society of Refrigerating Engineers ceased its corporate existence and merged with ASHAE to become the American Society of Heating, Refrigerating and Air Conditioning Engineers. The merger prompted the following statement on the cover of the inaugural ASHRAE Journal:

"There will result new unity and concentrated efforts upon the solution of engineering, research, design, development, installation, application and operation problems of members."

June 23, 1959:

ASHRAE holds its first annual banquet at the Lake Placid Club in the Adirondacks

And that is how ASHRAE came to be!

Mission Statement

ASHRAE will advance the arts and sciences of heating, ventilation, air conditioning, refrigeration and related human factors to serve the evolving needs of the public and ASHRAE members.

Vision Statement

ASHRAE

~ Will be the global leader in the arts and sciences of heading, ventilation, air conditioning & refrigeration.

~ Will be the foremost, authoritative, timely and responsive source of technical and educational information, standards and guidelines.

~ Will be the primary provider of opportunity for professional growth, recognizing and adapting to changing demographics, and embracing diversity.

Presidential Award of Excellence Totals

Presidential Award of Excellence (PAOE) is the point system ASHRAE Region and Society use to help track the Chapter's activities. The chapter gets points in the below categories for activities that we do throughout the year. The awards banner that you see at the meetings represents CVC's accomplishments over the years. Below are definitions of what some of those awards are. If you want to know more about PAOE check out the www.ashrae.org website and do a search for the 2006-2007 PAOE newsletter.

End of Year Awards Available to the Chapter:

PAOE: Minimum in five of the six categories

Special Citation: Minimum in 5 of the 6 categories with a minimum total of 4600 points

STAR: PAR in all categories

Honor Roll: PAOE for at least 4 consecutive years

High Honor Roll: STAR for at least 4 consecutive years

Premier: PAOE every year since the chapter's inception or since 1970; minimum of 4 years; chapter's first year is excluded

Sustainability Activities Award: A Chapter Sustainability Award in the form of a certificate is available for each chapter that obtains a total of at least 200 points from the items listed under Sustainability Activities in the Chapter Operations category of PAOE. The Chapter with the highest PAOE Sustainability point total will receive a Regional award in the form of a glass plaque and a certificate.Level 1 = less than 100 members; Level 2 = 100-249, Level 3 = 250-449, Level 4 = 500 or more.

Category	PAR	(2010-11)
Membership Promotion	800	1110
Student Activities	500	785
Technology Transfer	850	625
Research & Promotion	1050	2297
History	200	0
Chapter Operations	500	570
Chapter TOTAL	**3900**	**5387**

2009-2010 BOARD OF GOVERNORS	
Pete Bailey T: (802) 434-2278 Company: Dodge Engineering & Controls Inc pfbailey@deicontrols.com	Scott Alexander T: (802)655-7628
Sandy LaFlamme T: (888) 921-5990 x. 1097 Company: Efficiency Vermont slaflamme@veic.org	Dick Wilcox T: (802) 655-8805 Company: Vermont Heating @ Ventilation, Inc. dwilcox@vhv.com
Gretchen Langfeldt T: (802) 651-4114	

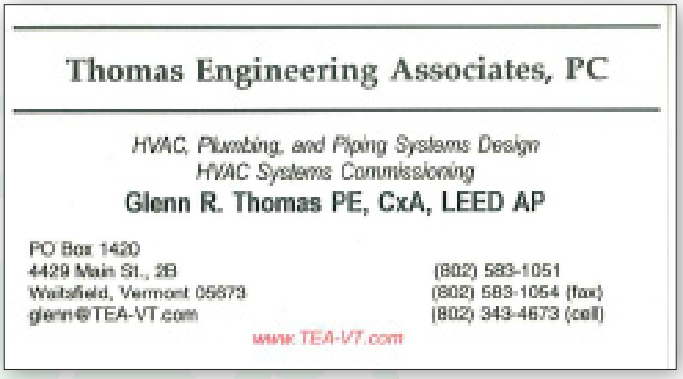
2009-2010 CHAPTER OFFICERS	
President	Shawn LaBelle T:(802)862-5900 x.146 shawn.labelle@vtmechanical.com
President- Elect	Mike Cook T:(802) 291-0911 mcook@arcmech.com
Vice President	Tom Dacres T:(802) 318-3298 tomd@vhv.com
Secretary	Nathan Mascolino T:(802)655-8805 x.148 nathanm@vhv.com
Treasurer	Ken Secor T: (802)309-5435 kpsecor@gmail.com
Administrator	Matt Tanis T: (802)860-4888 x.1228 mtanis@hallam-ics.com
COMMITTEE CHAIRPERSONS	
Student Activities	Shawn LaBelle T:(802)862-5900 x.146 shawn.labelle@vtmechanical.com
Membership	Tom Dacres T:(802) 318-3298 tomd@vhv.com
Resource Promotion	Sandy LaFlamme T: (888) 921-5990 x1097 slaflamme@veic.org
Technology Transfer	Mike Cook T: (802) 291-0911 mcook@arcmech.com
Refrigeration	Pete Bailey T: (802) 434-2278 pfbailey@deicontrols.com
Historian	Gretchen Langfeldt T: (802)651-4114 glangfel@hotmail.com
Newsletter Editor/ Webmaster	Cara Gorman T: (802)777-9813 cara0773@gmail.com

Subscription to the newsletter and membership questions should be directed to Tom Dacres (802) 318-3298 or tomd@vhv.com


VERMONT MECHANICAL
INCORPORATED
James D. LaVallee
Director of Business Development
Vermont Mechanical Incorporated
P.O. Box 728
Williston, Vermont 05495
Phone: 802-662-5800 Ext.158
Fax: 802-662-2219
Jim.LaVallee@vtmechanical.com
www.vtmechanical.com

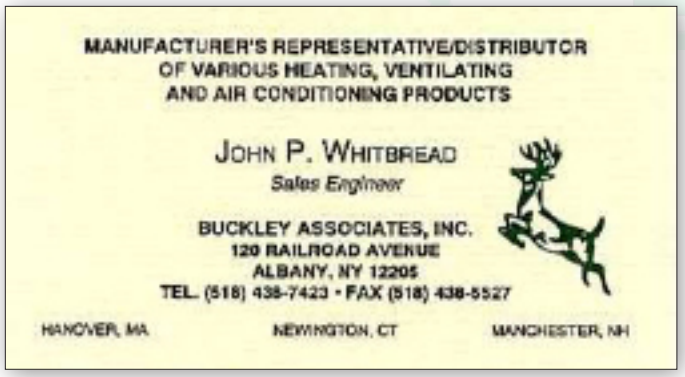

VHV
Vermont
Heating & Ventilating
A Mechanical Company
Thomas F. Dacres, Jr.
Design Engineer
tomd@vhv.com
16 Tigan St., Suite A, Winooski, VT 05404
802.655.8805 phone
ext. 152
802.655.8809 fax


Tom Zoller PE
Sales Engineer
TRANE
Trane
Burlington Office
175 Leroy Road
Williston VT 05495
TEL 802 864 3816 FAX 802 864 5093
TEL 888 277 1497
Tzoller@trane.com
An American Standard Company


Thomas Engineering Associates, PC
HVAC, Plumbing, and Piping Systems Design
HVAC Systems Commissioning
Glenn R. Thomas PE, CxA, LEED AP
PO Box 1420
4429 Main St., 2B
Waitsfield, Vermont 05673
glenn@TEA-VT.com
(802) 583-1051
(802) 583-1054 (fax)
(802) 343-4673 (cell)
www.TEA-VT.com


EST. 1970
THERMAL ENVIRONMENT SALES, INC.
11 SITTERLY ROAD • CLIFTON PARK • NEW YORK 12065
ERIK J. BRUHNS
VICE PRESIDENT
ENGINEERING SALES
TEL (518) 373-1100
FAX (518) 373-1800
E-mail: ebruhns@teshvac.com


Engenuity
consulting, inc.
Mechanical & Process Engineering
Energy Projects & Analyses
Commissioning & Start–Up
802.652.0099 ▪ www.EngVT.com


MANUFACTURER'S REPRESENTATIVE/DISTRIBUTOR
OF VARIOUS HEATING, VENTILATING
AND AIR CONDITIONING PRODUCTS
JOHN P. WHITBREAD
Sales Engineer
BUCKLEY ASSOCIATES, INC.
120 RAILROAD AVENUE
ALBANY, NY 12205
TEL. (518) 438-7423 • FAX (518) 438-5527
HANOVER, MA
NEWINGTON, CT
MANCHESTER, NH


TECHNOLOGY PLUS
121 DRAHOS DRIVE
ALTAMONT, NY 12009
518-355-1178 FAX 518-355-1246
WWW.TECHPLUSLLC.COM
BRIAN SEXTON
EMAIL: BRIAN@TECHPLUSLLC.COM
OFFICE 518-664-0012
FAX 518-664-5378
CELL 518-320-2733
BOILERS • HYDRONICS • STEAM SPECIALTIES