Belimo Energy Valve™ Webinar Q&A
A new tool for simplifying project commissioning and verifying your HVAC design.

1. **Is it similar to a VAV box in air AC systems?**

   Answer - Yes, the Electronic Pressure Independent Valve (EPIV) and Energy Valve (EV) is very similar to a VAV box in an air system with the key addition of temperature sensors upstream and downstream.

2. **One reason we, as a consulting engineering firm, standardized on true Pressure Independent (PI) control valves was that the mechanical section `eats` excess pressure to hold a fixed 3 - 5 psi pressure drop across the control valve which results in good controllability and low wear (wire draw) on the control valve. As I see it, the new electronic version is just a flow meter mated to a control valve and it results in the control valve having to `eat` the entire differential pressure (many times over 50 psi) at low flows. I see this resulting in potential wire draw and shortened valve life. How has this been addressed?**

   Answer - The Characterized Control Valve active control surfaces materials of construction are stainless steel and are resistant to wire-draw. Our Electronic Pressure Independent Valve (EPIV) has been used extensively by many customers in thousands of applications and has never had evidence of wire-draw.

3. **Any advantages over VFD`s**

   Answer - The Energy Valve complements the performance of a VFD, making it more effective and further reducing a system's volumetric flow requirement. The Energy Valve allows the VFD to run at lower speeds, reducing energy consumption.

4. **Are these valves available in 3-way configuration?**

   Answer - Currently the Energy Valve is only available in 2 way configurations.

5. **Your coil characteristics show a higher Delta T as flow is reduces. My experience with cooling coils is that this is true to a point - at low flows (under 20% +/-) the flow becomes laminar resulting in a loss of heat transfer and drop in Delta T. How can you show Delta T going up during laminar flow?**

   Answer - At flows lower than 30%, the Delta T control is automatically deactivated and the valve control changes to only the pressure independent control mode. We never observed a transition from turbulent to laminar flow heat transfer on the coils. This may be because the inside diameter is reduced due to the build-up of material increasing the Reynolds number into the turbulent regime, or the interior surface becomes rough over time delaying the transition to laminar.

6. **What is the price range from the smallest to biggest size?**

   Answer - We will have one of our sales consultants contact you to discuss pricing. Or contact us at 800-543-9038 (US), 866-805-7089 (Canada), 203-791-8396 (Latin America and the Caribbean).

7. **How are the characteristics of the actuator and the valve integrated to produce one operating characteristic for the combination?**

   Answer - The Valve and Actuator are engineered to work together. For example there is an anti-hunting algorithm in the valve that prevents the valve from modulating until it exceeds the tolerance of the valve.

8. **Energy Valve forced Delta T. If the room needs more cooling and the valve chokes the flow because the Delta T is not what is desired, how does the room get more cooling? Does this operation require VAV?**

   Answer - The space set point will still be satisfied but will be satisfied utilizing less flow optimizing the characteristic of the coil. (Assuming the coil was properly designed and maintained)

9. **Will the slides from this webinar be available for all attendees after the presentation?**

   Answer - A recording of the webinar is posted on www.EnergyValve.com.

10. **Is it a globe valve? Can you use ball or butterfly valve instead?**

    Answer - The Energy Valve is actually a ball valve, other type valves could be used but they all have individual characteristics. At this time the Energy Valve is available utilizing ball valve technology.

11. **Any calibration required for flow sensor or actuator during install or years following?**

    Answer - The Energy Valve ship fully calibrated from the factory and does not require future calibration.

12. **Are the valve bodies standard bolt pattern?**

    Answer - The valve bodies are a standard ANSI 125 configuration.

13. **Since the valve body is large in order to achieve laminar flow, the Cv must be sufficiently small to provide control. How do you determine which the Cv to use?**

    Answer - CV is not required for the Energy Valve. The Energy Valve as with all pressure independent valves is selected by the required GPM.

14. **I believe pressure independent valve wastes energy because it absorbs excess pressure of the system. Piping can be arranged so that all valves use the same pressure upstream.**

    Answer - Reverse return piping is good in theory but difficult to achieve. The Energy Valve is potentially a low 3 to 5-psi, pressure drop control valve, wasting very little energy.

15. **Wasted flow adds to pumping costs and perhaps the need to bring another chiller on line. What is the pumping cost that is saved? Pick a system say 750 tons two chillers and P/S pumping.**

    Answer - The pumping costs saved on one of our Beta site buildings was on the order of $10,000 per year. The projected impact on the chilled water plant due to correcting the Delta T from 6°F to 12°F, is and additional $30,000.

16. **Do you install the Energy Valve in addition to a DDC temperature control valve? How does the DDC modulating control valve (maintaining the Disch Air Temp) affects the Energy Valve trying to maintain the flow to maintain the Delta T setpoint?**

    Answer - The Energy Valve replaces the conventional control valve and receives its analog input signal from the DDC system. When the Delta T control mode is invoked it overrides the DDC control signal because the Delta T has been reduced below the Delta T setpoint. This is within the capability of the coil to achieve based on the heat exchanger design Delta T or the energy curve determined by running the coil in the pressure independent mode.

17. **This valve can you use for all AHU`s that you have in a building or can I put one valve after the pumps?**

    Answer - The valve can be used for all AHU's that you have in the building.

18. **What happens to the discharge air temp when the Delta T Manager™ is active?**

    Answer - The discharge air temp will be maintained when the Delta T Manager is active, using less flow based on the characteristic of the coil.

19. **How does a pressure independent valve work in a variable volume hydronic system?**

    Answer - A variable volume hydronic system has a VFD on the pump and the response time of the VFD is relatively slow in response to changes in system pressure. The instantaneous changes to system pressure as different zones occur very quickly and consequently pressure dependent control valves will overflow or underflow momentarily until the VFD makes its adjustment. A pressure independent valve responds to those pressure changes immediately.

20. **Address the physical size for GPM: 25, 50, 75, 100 GPM.**

    Answer - The Energy Valve product line ranges from 2.5" to 6"covering max GPM of 90-713 GPM. For your examples our best fit would be the 2.5"valve which covers GPM from 90-127. The lower GPM values in your example would not be covered by the Energy Valve.

21. **Learning about systems; in a multi-chiller system, would the second chiller always turn on based on flow? I would have guessed based on #1 not meeting its output Delta T?**

    Answer - Well you are correct in both actually. The second chiller would be engaged based on volumetric requirement. Flow and Delta T are inversely proportional so as flow increases Delta T decreases. Essentially the 1 chiller could potentially handle the volumetric requirement if operating at the correct Delta T.

22. **Since the control of the valve lives in the actuator what does the unit DDC controller do?**

    Answer - The DDC controller is eventually satisfied and believes it is controlling as the coil reestablishes the Delta T. When the Delta T is rehabilitated control is handed back to the DDC controller.

23. **Do you have any rule of thumb energy reductions by installing this valve? Is this a better application for new or existing systems?**

    Answer - Energy reduction varies based on the actual system components, set-up etc. As an example we have a case study from MIT available at www.energyvalve.co where they experienced a 25% savings on pumping power.

24. **Is it cost effective to you at this point to produce the energy valve in the smaller sizes?**

    Answer - Belimo is always looking at ways to expand their product lines. This expansion is done by providing a solution based on customer needs and input. There is a possibility for the Energy Valve in the near future to be available in smaller sizes.

25. **Is there a more detailed printable explanation of this valve and the service tools used to configure it?**

    Answer - Please visit www.energyvalve.com for comprehensive downloadable technical information and additional product support information.

26. **Can you use on plate frame heat exchangers?**

    Answer - Yes, these can be used on plate and frame HX's.

27. **Compared to a system with "traditional" control valves, would a system with these valves have a higher overall system pressure drop, thus increasing pump energy over the life of the building?**

    Answer - The system will have a lower pressure drop than conventional valves because the overall system flow rate is reduced.

28. **Do these valves achieve PI operation by electronically by flow feedback measurement, unlike the mechanical control in the PICCV?**

    Answer - The Energy Valve utilizes data from the flow meter and feedback from the DDC to control flow unlike mechanical control in PICCV.

29. **Explain why the question: Is the valve good for 3-way a non-issue because it misses the objective. The concept is to minimize flow and maximize Delta T.**

    Answer - Three-way control valves are used on constant volume systems with the pumps running at constant speed. The Energy Valve is a two-way control valve designed to run on variable volume systems with VFD's controlling the pump speed.

30. **By limiting/controlling Delta T, aren`t you sacrificing control of leaving air temperature?**

    Answer - The space set point will still be satisfied but will be satisfied utilizing less flow optimizing the characteristic of the coil.

31. VFD has a minimum flow restriction.

Answer - Our minimum flow is 30%. VFD's can go as low as 10%.

32. What is the best use of the position functionality? Could you give us an example, please?

Answer - Position functionality which is pressure dependent operation is utilized to benchmark a system. The valve would be operated in position control in order to determine power and energy data, (totalized power output of the coil). Then the valve would be switched to pressure independent operation to benchmark the power and energy improvements over position control. Finally, the Delta T manager would be turned on to quantify further improvement.

To further explain, a recommended procedure when design flow and design Delta T are not known as in the case of a retrofit would be:

1. Before removing the old valve and circuit setter, position the valve fully open.
2. Using a manometer, read the corresponding differential pressure across the associated coil. (This assumes you have P/T ports existing.)
3. Make a notation of this reference pressure.
4. Remove the old valve and circuit setter.
5. Install the Energy Valve.
6. Using position mode on the Energy Valve, command the valve in small increments while again measuring the coil differential pressure. When you reach your reference pressure notated earlier, read the flow reading from the Energy Valve.
7. This flow reading now becomes the design flow rate for the coil (the Vmax setting for the EV).
8. Now you can operated in pressure independent mode while you are gathering data to analyze for Delta T setpoint consideration later.

Note: If you remove the old valve and circuit setter and then operate the EV in pressure dependent mode, you have no maximum flow limiting because you have removed the circuit setter. This could cause drastic overflow that could cause the pump to trip out on high current and even if not, you can exacerbate the low delta T during the testing period!

33. Do you have any cost savings data from an actual site?

Answer - Energy reduction varies based on the actual system components, set-up etc. As an example we have a case study from MIT available at www.energyvalve.co where they experienced a 25% savings on pumping power.

34. Do they communicate via BACnet back to a building automation system?

Answer - The Energy Valve is BACnet capable. The valve is equipped for BACnet IP and BACnet MSTP.

35. Is a weather shield or NEMA 4 actuator design available?

Answer - A weather shield is available but at this time a NEMA 4 actuator is not available.