

# Energy Efficient Valves for Green Design



## **PICCV & ePIV**

PRESSURE INDEPENDENT CONTROL VALVES



**BELIMO**<sup>®</sup>

# Don't Leave Efficiency to Chance.

With Belimo Pressure Independent Technology, every system lives up to its full potential – saving time, money, and other precious resources.

It's a fact. Efficient operation of variable flow systems cannot occur without effective flow balancing and control. Pressure fluctuations, system instability, and even minor design flaws will rob owners of efficiency throughout the life of the system.

There is a better way. Belimo pressure independent technology helps owners maximize the energy savings of variable flow pumping systems while addressing their unique control challenges.

Packaged into two product innovations – the PICCV and the ePIV – this technology has tamed costly flow control issues in thousands of installations throughout the world.

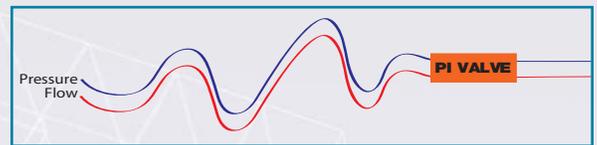
Pressure independent valves directly control the water flow required by the coil and are not affected by pressure fluctuations in the system. The valves are selected based on the GPM requirements of the coil and no Cv calculations are needed. By precisely controlling the flow, the pressure independent valves eliminate the need for balancing valves, thus reducing the installation and balancing cost. By far, the biggest benefit for the owner comes in the form of energy savings by eliminating overflow thru the coil. Overflow wastes energy by over pumping and is the main cause of the low  $\Delta T$  syndrome in chilled water systems.

Belimo pressure independent control stabilizes control of variable flow systems for a lifetime of efficiency and worry-free, automatic balancing.

Everyone agrees that variable flow pumping systems have the potential to save facilities thousands of dollars in pumping energy. But all too often these savings quickly disappear due to complex flow issues.

With Belimo Pressure Independent Control technology only a single valve is required to maintain proper flow through each circuit. Each valve arrives from the factory pre-set for each circuit, so there is no additional balancing required. The system performs perfectly from start-up. And if a facility adds new circuits as a result of expansion, the flow control of existing circuits remains intact – so no rebalancing is required.

Pressure independent valves can be used to regulate flow through air handlers, heating and cooling coils, fan coil units, unit ventilators and VAV re-heat coils.



## PICCV

The Pressure Independent Characterized Control Valve (PICCV) combines a differential pressure regulator with a 2-way control valve to supply a specific flow for each degree of ball opening – regardless of system pressure fluctuations. The valve performs the function of a balancing valve and control valve in one unit. Therefore, the flow characteristic and operation of the valve is not distorted in the system.



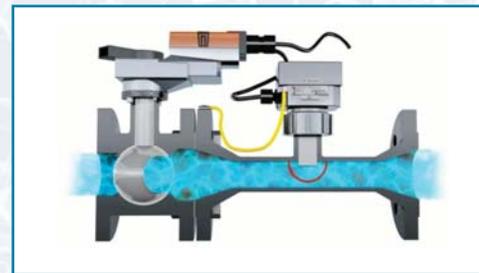
### How It Works

As flow passes through the valve, a uniquely designed pressure regulator moves according to the change in pressure above and below it. The regulator assembly adjusts to the differential pressure increasing and decreasing the orifice so the differential pressure across the ball stays constant.

The valve maintains a constant exiting flow despite any and all changes in system activity, including changes in demand, system redesign, and virtually any occurrence that results in pressure variation.

## ePIV

Like the PICCV, the ePIV maintains consistent flow despite changes in system pressure. Available in sizes 2 1/2 to 6" it is suited for larger piping systems than the PICCV can accommodate.



### How It Works

The ePIV directly measures flow by combining a magnetic flow meter and a 2-way control valve. The actuator has a powerful algorithm that modulates the control valve to maintain the exact flow based on the control signal set by the DDC Controller. The flow reading is reported back to the controller using a standard signal, and this value can be used by the Building Automation System to perform advanced control and energy strategies.

# Owners, Engineers, Contractors and Mother Earth ALL Benefit



## With Belimo Pressure Independent Technology everyone wins.

OWNERS save money at the beginning of a project and throughout the life of the system. CONTRACTORS save time and labor. ENGINEERS avoid complex sizing at the design stage and gain greater peace of mind that the system will operate correctly from the beginning. Finally we all save earth's precious resources.

### Benefits of Pressure Independent Technology:

- Eliminates Low  $\Delta T$  issues that frequently plague variable flow systems and rob chillers of efficiency.
- No separate balancing valve is needed to maintain proper flow through circuits.
- Common problems such as over-flowing and under-flowing terminal units are eliminated. Variable flow pumping systems and the circuits they serve work as one finely tuned system.
- Eliminates rebalancing when systems change.
- No complicated Cv calculation required. Valve selection is simply a matter of knowing the required flow and selecting the closest size up. So if the flow is 8.7 GPM, the correct selection is a 9.0 GPM valve.
- No balancing procedure required prior to start-up. Commissioning is a matter of simply confirming flow.
- Pumping costs reduced for the life of the system.
- Overall system optimization – Chillers, boilers, and heat exchangers perform more efficiently when correct flows are maintained under full and part load conditions.
- Improves monitoring and troubleshooting capability – Feedback signals can be reported back to the BAS so operators can observe exactly what is happening to the system in real time.
- Spaces achieve their setpoint temperatures faster – even during morning start-ups because pressure independent control eliminates the over and under flow typical associated with multi-circuit systems.
- Self cleaning design. When the ball valve opens any debris collected at the valve inlet is carried away. It is not necessary to install a strainer on each terminal unit when a pressure independent valve is installed. Belimo recommends installing a strainer per loop to protect other components.
- More accurate control range with the disc characterization and the rotational angle of the ball valve compared to globe valve technology with very short stem travel. A ball valve rotates up to 90° having a maximum control range, a short stroke valve with as little as 1/8" of stem travel will have a hard time maintaining accurate flow control.
- Removes the hassle out of hydronic system flushing. System flushing is performed with the valve installed and there is no need to remove any component.
- No maintenance required and backed by a 5-year warranty.



ORANGE is the color of reliable performance. And nothing could be GREENER than that.



Each year owners invest millions of dollars in high efficiency heating and cooling equipment all for the sake of being green. All too often these investments fall short of expectations.

With product innovations like the PICCV and ePIV owners make the most of those investments with technology that has proven itself over and over again.



**Department of Transportation (DOT), headquarters in Washington D.C.**

"This was a great fit for the DOT project," remarked the US Government Accounts Manager for Belimo AirControls. "The PICCV is a must-have for complex variable primary systems like this. Accuracy, efficiency, and low maintenance were critical for this large facility."



**Eglin Air Force Base, Florida**

"You can do [variable flow] with standard 2-way valves, but it is tricky. With Belimo PICCV valves, you just need to maintain a minimum 5 psi drop across the valve and it automatically maintains proper flow to your circuits," said Spencer O'Quinn, Project Manager for the Federal Business Unit of Chevron. "Standard 2-way valves, which have many different pressure requirements, will hunt all over the place in a variable flow system."



**1100 Peachtree, Atlanta, Georgia**

"We fully expect to see the efficiency of the building to improve and electric bills to decrease," said Roger Bennett of WayPoint Systems.



**Sonoma State University, Sonoma, California**

Principal engineer, Tony Costa says "...improve the control range of the valve, and you'll reduce overall energy consumption of the system."



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