



Committed to energy-efficient solutions



PICV Multi-functional Valve offering great energy savings

According to a recently completed market study by [marketwatch](#) the demand for PICVs is still expected to grow by 13% in the coming 4 years. This follows a period of strong growth in Europe and in the UK, which is amongst the [most advanced markets](#) in the world when it comes to PICV installation adoption.

It is the energy saving potential that made PICVs the preferred choice of hydronic system designers and building owners. PICVs are credited to save up to 30%⁽¹⁾ of energy in a commercial or industrial building and enable a simplified system design, eliminating the need for commissioning and differential pressure control valves, which delivers further cost savings.

PICVs can be applied to variable or constant flow systems⁽²⁾. The PICV will ensure a controlled flow passing through the system regardless of the fluctuating pressures under part load conditions.

A typical PICV incorporates a differential pressure and a control valve element⁽²⁾. The internal differential pressure controller maintains the pressure difference across the control valve element. The valve may be pre-set manually or via an actuator, where the pre-setting scale indicates values between maximum rated flow and minimum prescribed flow. This minimum prescribed flow may be a minimum stated flow or closed – this is design-dependent⁽²⁾.

The control valve element typically combines independent full stroke modulation control and automatic balancing functionality, making the pressure independent control valve effectively a 3 function valve in one valve housing.

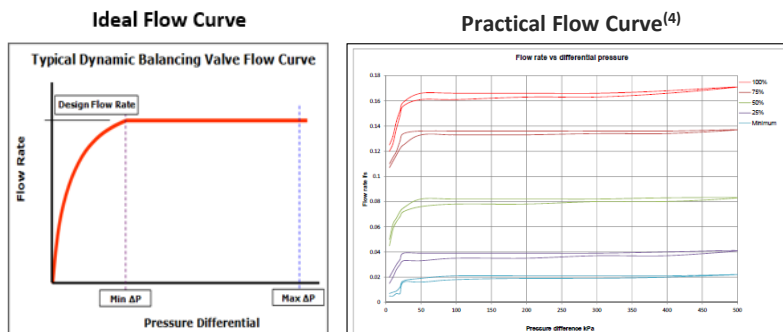
There are axial and rotary mechanical PICVs, as well as electrical PICVs, which each have their own benefits. In order to realise the energy saving potential of the PICV valve function, it is essential that the PICV is accurate to set and the performance is consistent (repeatable). Measured over time, [a 1% increase in the accuracy of a PICV can result in a reduction of around 0.5% in the buildings overall HVAC energy consumption](#)⁽³⁾.



Characteristics and design elements that contribute to the PICV's accuracy

- Self-adjustment of the PIC valve to continuously self-balance, ensuring the delivery of the design or pre-set flow rate to each terminal unit.
- 100% authority pressure independent flow control, even when there is a variance in pressure differential.
- The control should be full stroke modulation. If it is not and control/stroke length is sacrificed to achieve flow balance at low flow rates the valve characteristics will tend to be ON/OFF.
- Material used in the inner valve – composite materials have proven to allow for greater accuracy than alloys.
- Distance of valve settings on the scale – if set points are too close together, it is difficult to achieve accurate settings.
- Dirt tolerance and serviceability - a rectangular aperture is more tolerant than an annular aperture as it presents a larger lift for the same effective area. Removable inserts are worth consideration as they simplify maintenance should the PICV get blocked with debris.
- ΔP range – low start up pressure to reduce the head required from the pump.

PICVs with the above characteristics will deliver the best repeatability (lowest hysteresis) close to the ideal flow curve for a dynamic valve with a constant flow between the minimum and maximum differential pressure – the operating range.



A detailed CPD workshop can be provided on request.
Please contact us cpd@flocontrol.ltd.uk.

