Bypassing the Problem or Just Solving It?

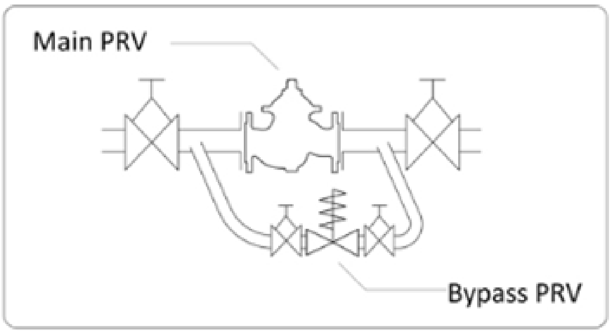
The Case for True Low-Flow Regulation in Pressure Reducing Valves

Water distribution systems demand efficiency, reliability, and stability, especially under low-flow conditions. Yet, many pressure reducing valves (PRVs) struggle when demand drops below 20%-10% of their nominal capacity.

The consequences? Instability, increased maintenance, water-loss and even infrastructure damage. Research has shown a strong correlation between unstable PRV operation and higher occurrences of pipe ruptures and water loss. Fluttering and pressure fluctuations accelerate wear on pipelines, leading to costly leaks and inefficiencies.

To solve the problem, most industry solutions introduce workarounds, like V-port trims and external bypasses, which come with significant limitations.

The Industry Standard: Workarounds That Don't Work



To combat low-flow instability, most manufacturers rely on two common methods;**V-port trims** and **external bypasses**, but these approaches have inherent shortcomings:

V-Port Limitations:

1. **Limited Effectiveness Below 10% Flow** – V-ports helps stabilizing the pressure down to 10% of the nominal flow. Below that, a bypass is still required.
2. **Restricted Flow Capacity** – The smaller passage area in a V-port reduces the valve's Kv (flow coefficient). If designers overlook this, they may miscalculate system performance.

Bypass Shortcomings:

1. **Increased Complexity & Maintenance** – A bypass adds extra components, increasing installation costs and requiring more frequent servicing.
2. **Larger Space Requirements** – Extra piping and devices increase the system's footprint, making installations cumbersome.
3. **Higher Setpoint at Low Flow** – Since the bypass valve's setpoint is always higher than the main PRV, nighttime or low-flow conditions result in increased pressure, leading to more leaks and higher water losses.
4. **Reliance on Direct-Acting PRVs** – Many bypass solutions depend on direct-acting pressure reducing valves, which are less reliable. Their setpoints can shift with flow, sometimes deviating by up to 2.5 bar.
5. **More Devices to Maintain** – Extra components mean additional maintenance and higher operational costs.

While these workarounds help mitigate instability, they don't address the root cause—the inability of standard PRVs to handle ultra-low flow rates effectively.

A New Approach: True Low-Flow Regulation with Aquestia S300

The **Aquestia S300 series** eliminates the need for external bypasses and V-ports by seamlessly regulating flow down to **1 m^3/h at any valve size**. No instability, no fluttering, just consistent, reliable pressure control.

Key Advantages of the Aquestia S300:

✅ **Full-Range Stability** – The S300 maintains precise pressure regulation from high to ultra-low flow without extra components. ✅ **No External Bypass Needed** – A simplified system means reduced complexity and lower installation costs. ✅ **Superior Durability** – By eliminating fluttering, the valve ensures longer lifespan and minimal maintenance. ✅ **Compact & Efficient** – Without a bypass, installations take up less space—perfect for tight or retrofit applications. ✅ **Consistent Setpoint** – Unlike direct-acting PRVs, the S300 holds a steady pressure setpoint across all flow conditions, ensuring accurate and reliable control.

The Verdict: Solve the Problem, Don't Bypass It

For years, bypasses and V-ports have been the default industry response to low-flow instability. But why accept a workaround when a **true solution exists?** The **Aquestia S300** redefines PRV performance by delivering reliable, full-range pressure regulation without the inefficiencies of traditional designs.

When it comes to PRVs, the choice is clear: **bypass the problem or just solve it.**