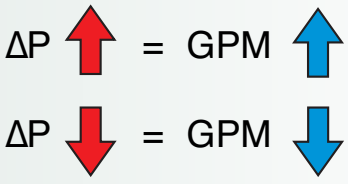
Automatic vs. Manual Balancing

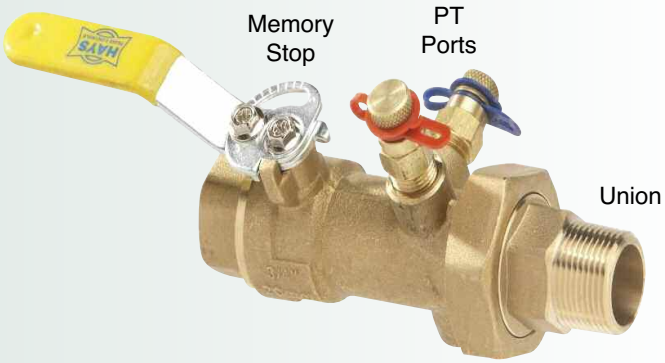
Hydronic HVAC systems are designed to provide a high level of thermal comfort, have low energy consumption, and must provide the flow rates as designed. Balancing and flow control valves provide the proper distribution of water flow within the hydronic system to meet these demands.

When considering the hydronic system feeding air terminal coils for zone control, the engineer has to first choose between a manually balanced system vs one with automatic flow controls. There is substantial performance and energy saving benefits to justify a system with automatic flow controls.

MANUAL BALANCING VALVES

Manual balancing valves are ***Pressure Dependent*** and do not adjust to changing system pressure:

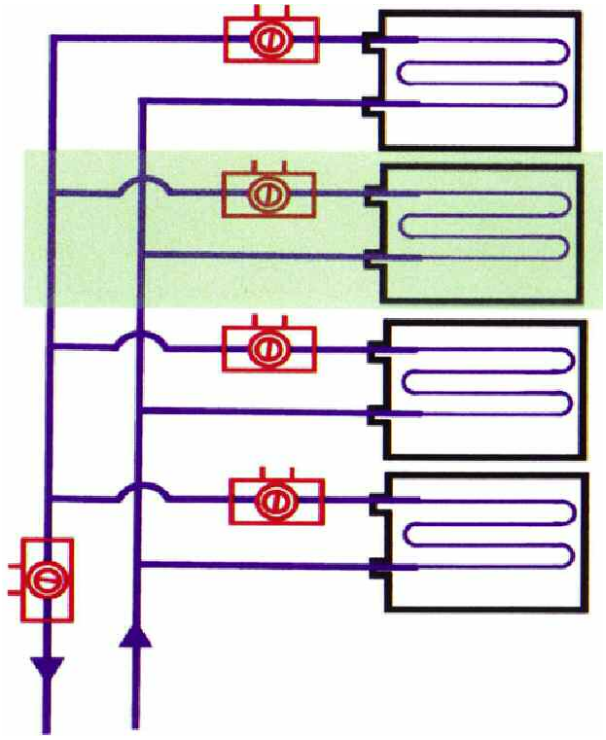




Manual Shut-Off / Balancing Valve

Using Manual Balancing Valves have the following drawbacks:

- System balancing normally requires balancer to make at least 3 adjustments to each manual balancing valve.
- Some municipal energy codes require systems to be re-commissioned every few years
- Control designed water flow only at the pressure during the balancing phase of the project (typically 100% of design flow).
- Actual water flow will vary as the system pressure varies creating essentially an unbalanced system.
- System rebalancing is required anytime the hydronic system is reconfigured.
- By allowing human override, the manual system can indiscriminately be modified from the design intent.
- When manual valves are used on the air terminals, additional valves will be required on the riser as well.



Automatic vs. Manual Balancing

AUTOMATIC BALANCING VALVES

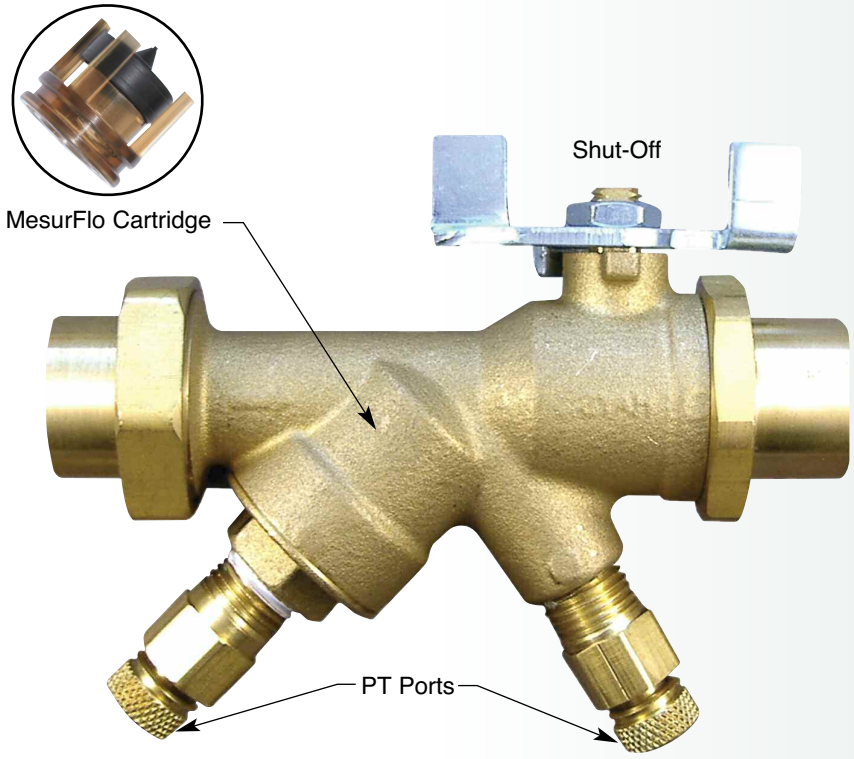
Automatic balancing valves are Pressure Independent and keep the water flow constant regardless of pressure changes.

ΔP ↑ = Valve Closes = Constant GPM

ΔP ↓ = Valve Opens = Constant GPM

Using Automatic Flow Control Valves with MesurFlo technology have the following benefits:

- No balancing costs – Automatic Control Valves do NOT require balancing.
- Initial cost difference between Manual and Automatic balancing valves are minimal.
- Eliminates over-pumping at part load thereby reducing pumping cost.
- Maintains water temperature drop which maintains boiler efficiency.
- Reduces water noise and erosion.
- Only required at the air terminals – no balancing valves required on the riser. Results in fewer valves needed.
- No system rebalance is required if terminal units are reconfigured within the sytem.



Mesurflo Automatic Balancing Valve