Each HVAC application has a different set of criteria for Selection, Control and Economy. Today’s Direct Digital Control (DDC) systems allow you to choose from different balancing systems with the same end result: stable air temperature. However, your choice of systems will impact the life of your actuator and pump and cost of operation.

Whatever your criteria, Griswold Controls is your choice.

**Selection**

(QuickSet with Unimizer)

Automatic Balancing: Flow Limit Control with Temperature Control.
(Automizer or IRIS with Unimizer)

(Griswold SM Valve)

**Control**

Proportional Balancing has no upper flow-limit control.

Automatic Balancing has upper flow-limit control within a pressure differential range.

Pressure-Independent Balancing has adjustable upper flow-limit control within a pressure differential range.

**Economy**

Proportional Balancing Systems exhibit overflow as individual valves open and close to accommodate space loads. As pressure changes affect the constant flow pump system, the pump operates at less than optimal energy efficiency, resulting in increased energy cost.

Flow Limited Temperature Control Systems do not exceed flow as the balancing valve absorbs excess pressure to maintain design flow in variable speed pump systems. Consequently, the energy cost is comparatively low.

Pressure Independent Control Systems modulate to infinitely variable fixed flow points within the valve’s flow and pressure range. These valves maintain stable flow within the hydronic system. While the initial cost of these valves is higher, they have the lowest energy cost.
Building Dynamics – Temperature and Hydraulic Diversity

Temperature Diversity means that there is heating and cooling diversity among locations. For example, during cold periods such as winter, mornings, or startup, a building’s outer shell (rooms and offices around the perimeter) needs heating due to heat loss from the cold temperature outside, while the core of the building may need cooling due to people, computers and lighting loads. Some areas may demand cooling at the same time others demand heating.

Hydraulic Diversity means that each location has a different supply and return pressure. The difference in pressure from area to area is caused by the On/Off and modulating action of valves and by the distance from the system pump. The larger/taller the building, the greater the distance that must be traveled. This diversity translates into a specific piping layout to satisfy delivery of water to each location.

Temperature Control

The room thermostat senses the load requirement to an electronic computer to turn an actuator which modulates or opens and closes a valve to increase or decrease water flow to provide heat transfer to a zone within the building. As an individual actuated valve opens or closes or modulates it creates pressure change to all other valve locations and changes pressure, flow and heat transfer. Balancing is required to simultaneously satisfy all the zones and keep the system working efficiently.

Valve Performance

QuickSet / Unimizer

- No Upper Flow Limit
  Balancing Valves and Temperature Controls have no upper flow limit. As pressure varies, flow varies proportionally.

- Optimizer Selection allows proper authority design which produces best control.
  The Optimizer is used in both QuickSet and Unimizer for more Cv selection and Equal Percentage Control.
**Valve Performance**

**Automizer**

- Temperature Control achieved below the design Flow Limit (0 – 3 psid)
- Regulated Flow Limit achieved with pressure independent AFC Cartridge (3 – 32 psid)
- Unregulated flow above maximum flow limit (32+ psid)

Flow limit and actuated ball valve temperature controls can be integrated into the same valve body because they perform sequentially. Temperature controls are selected by Cv to achieve a specific upward limit GPM flow. While actuated ball valves now provide more Cv selection than traditional globe valves, there can still be overflow conditions at a specific coil location.

This is when the automatic flow limit control does its job. It only limits flow to the specific GPM selected for a specific coil and thereby permits the unwanted water to be diverted (to less resistant circuits) and flow through the system to meet demand from other locations. The temperature control has complete authority throughout its design flow; the automatic flow control has authority only when the temperature control is fully open and flow would normally exceed the specific GPM selected by the design engineer.

**Automizer Flow Pattern**

Available psid Ranges:
- 1–14 psid
- 2–32 psid
- 4–57 psid

Below the control range, the cartridge acts as a variable flow device allowing flow to vary below the rated amount

Within the wide control range, the cartridge modulates in response to pressure differential changes to maintain a fixed flow rate within ±5% accuracy.

Above the control range, the cartridge acts as a variable control device, allowing flow to vary above the rated amount.
Valve Performance

SM Valve

**Pressure-Independent Temperature and Flow Control**

- Automatic Flow Control and balancing at all flow rates
- Infinitely adjustable, pressure-independent flow control
- Actuator rotation moves the horizontal fixed flow line up or down to provide temperature control modulation. Simultaneously, flow control is maintained along the horizontal portion of the graph within the minimum & maximum differential pressure limits (5 – 45 psid)

**Operation**

When a valve in the system opens or closes, it causes pressure change to other valves in the system (hydraulic diversity). The SM Valve maintains the required flow rate regardless of these pressure changes.

The actuator modulates the SM valve to a required fixed flow, independent of pressure. This more stable flow means less work for the actuator. Actuator life is increased and system energy expenses lowered.

The SM valve can limit the flow rate to almost an infinite number of flow rates below the specified maximum, providing balancing at any point below the maximum flow rate.

**Function**

On close examination of the inner workings of Griswold’s SM, the function is best described as two valves in one. The first valve regulates the pressure differential across the second valve by means of a rolling diaphragm element counteractivated by a helical coil spring. The second valve is a calibrated variable orifice device adjusted by the actuator (similar to a standard-modulating control valve). The total flow rate through the valve is determined by the combination of orifice areas in the pressure differential regulation unit and the actuator-driven variable orifice.

**Flow**

Since the Griswold SM is dynamic in function, temperature and flow control are not dependent on a specific pressure differential. As long as the pressure differential across the valve is within operating range, the flow rate is continuously regulated.

**Combined Valves**

**Separated Valves**

CONTACT US:
2803 Barranca Pkwy
Irvine CA 92606
TEL 800-838-0858  FAX 800-543-8662
www.griswoldcontrols.com