



Selecting HVAC Control Valves

Ball vs. Globe: No longer a cost issue

In the past, ball valves had been attractive to HVAC control contractors primarily because they appeared to be half the price of a comparable globe valve. However, this included the purchase price of the valve only, and not the costs of extra pipe reducers and added installation time. That said, with the advent of new ball valves and more competitively priced globe valves, the decision on whether to use a globe or ball valve is no longer dictated by price. This paper addresses some technical differences between ball and globe valves and makes recommendations on factors to consider when selecting the proper valve.

Technical Comparison

Technically, the globe valve has a stem and plug, which strokes linearly, commonly referred to as “stroke” valves. The ball valve has a stem and ball, which turns *horizontally*, commonly referred to as “rotational” valves.



Ball Valve

Early ball valves used a full port opening, allowing large amounts of water to pass through the valve. (See figure below.) This gave HVAC controls contractors the ability to select a ball valve two to three pipe sizes smaller than the piping line size. Compared to traditional globe valves that would be only one pipe size smaller than the line size, this was often a more cost-effective device-level solution. In addition, the ball valve could be actuated by a damper actuator, rather than expensive box-style “Mod” motors.



Close-up of “Flow Optimized”
or Characterized Ball Valve



Close-up of Full Port Ball Valve

Selecting HVAC Control Valves

Selection Guidelines

Flow Optimized Ball Valve

- Tight shutoff or high close offs of around 100 psi* are required
- Isolation or two position control**
- Cv ranges from 16 to 250 (equates to line sizes 1-1/4" to 2-1/2")
- Use for water or water/glycol solution only

* This equates to a pump head pressure of approximately 230 ft. Not very common HVAC applications

** Valve can be line sized to minimize pressure losses; butterfly valves are also used for these applications.

Globe Valve

- Close off of 50 psi or less (typical for most HVAC applications)
- High differential pressure across valve
- Rebuilding of the valve is desired
- Better control performance
- Better low flow (partial load) performance
- Use for steam, water or water/glycol media
- Smaller physical profile than a comparable ball valve

Most Cost-effective by Application

Let's look at a cost comparison as it relates to the decision to select ball or globe valves. For terminal unit applications requiring less than 25 GPM, the globe valve is a more cost-effective choice. However, on larger coils the "Flow Optimized" ball valve is the more cost-effective solution.

From a practical standpoint, many jobs will use mostly one type or the other. If the majority of valves on a project tend to be terminal unit valves, then globe valves would offer better control at a lower price. If the majority of the valves are for AHU's (1-1/4" or larger) Flow Optimized Ball Valves are the preferred solution from a pure cost standpoint.

Different tolerances to temperature, pressure and steam should also be considered in the selection process.

Pricing Comparison

Today, with equivalent pricing between ball and globe valves, the full port ball valve is falling out of favor for most HVAC control applications. This is also due to its poor installed flow characteristic that leads to its inability to maintain proper control. New "flow optimized" ball valves, specifically designed for modulating applications, have been developed. Flow

optimized ball valves are sized the same way as globe valves. They provide an equal percentage flow characteristic, enabling stable control of fluids. Additionally, there are more cost-effective valve actuators now available for globe valves. Better control and more-competitive pricing now puts globe valves on the same playing field as "Flow Optimized" ball valves.

Siemens Building Technologies, Inc.

HVAC Products Division

1000 Deerfield Parkway
Buffalo Grove, IL 60089-4513
USA
Tel. (847) 215-1000
www.valves-actuators.com

Siemens Building Technologies, Ltd.

HVAC Products Division

5462 Timberlea Boulevard
Mississauga, Ontario, Canada L4W 2T7
Tel. (905) 602-1959
www.valves-actuators.com