

Design Standard

General Duty Valves for HVAC

Purpose:

The heating, ventilating, and air-conditioning valves are an essential element of the mechanical systems. This design standard has the purpose of creating a consistent application of heating, ventilating, and air-conditioning valve requirements throughout the East Side Union High School District therefore achieving a standard of quality for maintenance, reliability, and energy efficiency throughout all renovation and new building projects.

Design Standard:

Design and specify work to include materials, installation and testing of valves for complete and operable systems.

General Requirements:

- All valves of a particular type and size range on any one project shall be the product of one manufacturer.
- Valves shall be installed with the valve bonnet in an upright position to prevent deterioration or corrosion of the bonnet and packing.
- Valve body materials shall be compatible with piping system materials.
- A valve drain shall be provided at the base of each water piping riser and manual air vents shall be provided at the top of each riser and at the high point of the system.
- All valves shall be provided with reusable strap-on insulation covers.
- All exposed valves in finished areas shall be chrome-plated.
- Insulation: Where insulation is indicated, install extended stem valves, arranged in proper manner to receive insulation

All general duty HVAC valves shall meet the requirements set forth:

- Ball Valves
 - System supply and return piping shut-off and isolation valves for application in piping system up to and including 2-1/2" in diameter
 - Class 125, bronze body, screw-in bonnet, integral seat, renewable disc, straight body
- Butterfly Valves
 - System supply and return piping shut-off and isolation valves for application in piping system over 2-1/2" in diameter
 - 6 Inches and Smaller: 200 PSI, ductile iron body, extended neck, aluminum bronze disc, reinforced resilient EDPM seat, manual lever and lock

- 8 Inches and Larger: 200 PSI, ductile iron body, extended neck, aluminum bronze disc, reinforced resilient EDPM seat, gear operator
- Globe Valves
 - Design for modulating services
 - 2 Inches and Smaller: Class 125, bronze body, screw-in bonnet, integral seat, renewable disc, straight body
 - 2-1/2 Inches and Larger: Class 125, iron body, bolted bonnet, flanged ends, renewable seat and disc, bronze mounted
- Balancing Valves
 - Provide balancing valves as required for proper balance and to maintain balance at part and full load conditions
 - Bronze with a machined orifice flow restriction, multi-turn globe type valve, internal O-rings, rated working pressure of at least 240 PSIG (175 PSI iron construction, 2-1/2 inches and larger), flow setting indicating pointer and calibrated nameplate, memory stops, and pressure readout port with integral check valve on each side of the orifice
- Check Valves
 - Where check valves are required, they shall be installed on the equipment side of all shutoff valves to facilitate servicing of the check valve
 - 2 Inches and Smaller: Class 125, bronze body, horizontal swing, regrinding type, Y-pattern, renewable disc
 - 2-1/2 Inches and Larger: Class 125, iron body, bolted bonnet, horizontal swing, renewable seat and disc, flanged ends
- Drain Valves
 - Class 125, bronze body, screw-in bonnet, rising stem, composition disc, 3/4-inch hose outlet
- Control Valves
 - The design documents shall include a valve schedule for all ATC valves. The schedule shall indicate service, flow, CV, and pressure drop
 - Control valves shall be closely coordinated with Division 25 requirements
 - 2-Inch or Less Two-Way Valves: Pressure independent, ball valve with forged brass nickel plated bodies and female NPT threads. Valves shall have blowout-proof stem design. Rate chrome plated ball and stem at a minimum of 400 psi water service with equal percentage characteristics from characterizing disc. Provide valves with reinforced Teflon seats. Minimum 200 psi close-off rating. Stainless steel, flow-limiting spring. 0-50 psi differential pressure operating range.
 - 2-Inch or Less Three-way Valves: Ball valve with forged brass nickel plated body and female NPT threads. Blow-out proof stem design. Rate stainless steel ball and stem at a minimum of 400 PSI water service with equal percentage characteristics from characterizing disc. Provide reinforced teflon seats.

- 2-1/2 Inch to 6-Inch Modulating Control Valves: Iron body, globe valve, with flanged ends, bronze seat, and 316 stainless steel stem. TFE V-ring packing. Maximum 25 PSI differential pressure.
- Two-Way and Three-Way Butterfly Control Valve: Valve body shall be of the full lug wafer style. Flanges shall meet ANSI 125 and 150 standards. Valves shall feature a single, through-shaft design for high-strength and positive disc control. The seat shall be made of heavy-duty, molded-in O-rings creating a positive seal between flange face and valve body. The seat shall provide positive bubble-tight close off.

Access Panels: Design access panels into the project where a removal type ceiling is not planned so all valves are easily identifiable and accessible. Access panels must be no smaller than 8" x 8" clear.

Location of Isolation Valves: Locate isolation valves so that it is possible to isolate separate floors, separate wings, machinery rooms and other natural subdivisions of the building. Design isolation valves on each side of equipment to permit servicing or removal without draining system. Design valves at all services left for future connections (tees, stubs, etc.,) unless they are in a valved zone, or can be isolated by existing valves with minor loss of pipe contents when opened

Access: All valves should be accessible by a technician; coordinate piping, cable trays, and conduit. Valves in equipment rooms that are move that 6.5' above the floor or platform should be equipped with remote operators to allow operation from a standing position, with provision to stow the remote mechanism out of walkways.

Approved Manufacturers:

- Ball, Butterfly, Globe Valves, Check Valves, Drain Valves
 - Nibco
 - Crane
 - Milwaukee
- Balancing Valves
 - Bell & Gossett
 - Armstrong
 - Nibco
 - Wheatley
 - Tour & Anderson
- Control Valves
 - Barber Coleman
 - Belimo
 - Griswold

Substitutes Allowed:

Yes, if performance and quality equivalency can be evidenced.

Associated Design Standards and Construction Specifications

- Division 23 HVAC Design Standards
- 23 05 53 - Identification For HVAC Piping And Equipment Design Standard
- 25 55 00 – Building Management System Design Standard

End of Document