

Butterfly Valves

Butterfly control valve assemblies 2" to 20" in size shall be cast iron body type for 2-way or 3-way applications specified constructed for tight shutoff and shall operate satisfactory against system pressures and differentials. Valve housing shall consist of polyester-coated cast iron, rated at no less than 175 [or 250] low [or line] voltage psi at 250 F. Valve housing shall have ANSI Class 125/150 flanges. Valve disk shall consist of Nylon 11 coated ductile iron disk. Aluminum, bronze, and stainless steel are also available. Valve shall have a blow-out proof stem with two EPDM Orings. Valve shall have resilient tongue-and-groove EPDM combination valve seat and flange seal with minimum, bubble tight close-off pressure of 50 [or 150, or 175, or 250] psi.

Valve Actuator

Electric control valve actuator shall accept analog modulating, floating (tri-state), or low [or line] voltage two-position signal as indicated in the control sequence. Pneumatic control valve actuators shall accept low pressure signal for proportional control, or 20 [or 80] psi air pressure signal for two-position control in a spring [or non-spring] return configuration. Actuators shall be provided by Honeywell. Actuator shall provide minimum torque required for full valve shutoff position. Wiring terminals shall be provided for installation to control signal and power wiring.

23 00 00 HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 09 00 Instrumentation and Control for HVAC

23 09 13 Instrumentation and Control Devices for HVAC

23 09 13.33 Control Valves

Flanged Butterfly Valves and Actuators

Mounting and Wiring

1. Valves shall be cast iron with ANSI/ASME 125 flange fittings from 2 to 20 inches (DN50 to DN500).
Valve body shall be coated with polymer resin for corrosion protection.
2. Valves shall provide equal percentage flow control characteristics up to 60° disk rotation.
3. Valve disk construction shall be Nylon 11-coated cast iron. Valve seat shall be peroxide-cured EPDM combination seat and flange gasket. Valve stem shall be blow-out proof stainless steel.
4. Three-way valve assemblies with cast iron pipe T's shall be used for mixing or diverting control and provide either A-B-AB or A-AB-B port orientations in a "T" pattern with side port.
5. Valve bodies shall have maximum static pressure rating of 250 psig (1700 kPa) at 250°F (120 C) with line voltage actuators or 175 psig (1207 kPa) at 250°F (120 C) with low voltage actuators.
6. Actuators shall be direct coupled rotary type requiring neither crank-arm nor linkage with 2-way valve bodies, and direct mount to the valve actuator bracket. The bracket shall provide for up to 2 inches (50 mm) of pipe insulation.

7. Actuators shall provide internal wiring terminal connections with threaded holes for flexible conduit strain relief fittings for line voltage wiring or where mechanical protection is required by local codes.
8. Valve actuator shall be capable of operating on 24 Vac Class II power (Safety Extra-Low Voltage), or be UL Recognized or CSA Certified to U.S. and Canadian Standards for use with line voltage.

Control

1. Electric actuators shall provide two-position, floating, or modulating control. Modulating control refers to direct acceptance of 2-10 Vdc or, with addition of a 500 ohm resistor, a 4-20 mA input signal. Floating control refers to direct acceptance of 24 or 120 Vac pulse-width modulated open and close commands from a tri-state (SP3T) controller. Two-position control of non-fail safe actuators shall be in the form of 24 or 120 Vac power controlled by SPDT switch. Two-position control of fail safe actuators shall be in the form of 24 or 120 Vac power controlled by SPST switch.
2. High pressure pneumatic actuators shall be rack-and-pinion design, with or without spring return and provide two-position or proportional control by means of air pressure, electric solenoids, pneumatic positioner, or electro-pneumatic servo controllers.
3. Industrial grade direct-drive actuators shall have polymer-coated, water-tight enclosures rated NEMA 4.
4. Modulating actuators shall provide a 2-10 Vdc feedback signal.
5. Proportional non-industrial grade actuators shall have a rotation direction control switch accessible on the cover to change between proportional or floating control.
6. Actuators shall have SPST or SPDT auxiliary switch for position verification as an available option.
7. Actuation will be available with fail-safe operation.

Other

1. Valves may not be installed with stems below the horizontal plane to prevent actuator damage due to stem seal leakage, or accumulation of particulate in the stem packing.
2. A water filtration and treatment system shall be installed and operated according to the requirements of Division 23 25 13, Water Treatment for Closed-Loop Hydronic Systems. The presence of excess rust in the system will void the manufacturer's warranty.
3. Under-cut disks shall provide 50 psid (345 kPa) close-off. Full cut disks shall provide 150 psid (1034 kPa) minimum close-off. Seat leakage when closed shall be ANSI/ASME Class IV, maximum 0.01%.
4. All spring return actuators must be designed for either normally open or normally closed fail-safe operation with a continuously engaged mechanical return spring. This spring must return the actuator to a fail-safe position within 20-25 seconds of power loss.
5. Run time shall be constant and independent of: load, temperature, and supply voltage (within specifications).
6. All valves and actuators shall be manufactured under ISO 9001 International Quality Control Standards.