

## 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

###### Cartridge Globe Valves and Dedicated Actuators

###### Mounting and Wiring

1. Valves shall be brass with female national pipe thread fittings in sizes from ½ up to 1 ¼ inches (DN15 to DN32) and sweat fittings from ½ to ¾ inches (DN15-20).
2. Valves shall be compact size capable of fitting inside terminal equipment such as fan coil units or unit ventilators.
3. Valves ½ to ¾ inches (DN15-20) shall use resilient seat materials for tight close-off, with equal percentage flow characteristics. Two-way valves shall be normally open.
4. Valves 1 to 1 ½ inches (DN25-40) shall use a pressure-balanced, metal seat construction for close-off not less than 145 psid (1000 kPa), with linear flow characteristics.
5. Multiple Cv ratings shall be available in valve sizes ½ to 1 inches (DN15-25).
6. Three-way valves shall feature A-B-AB porting for mixing control in coil-bypass applications. Flow capacity of the B port shall be reduced 20% to more closely balance loop pressure drops in coil-bypass applications.
7. Valves bodies shall have static pressure ratings of 230 psig (1600 kPa) at 230°F (110 C), minimum.
8. Actuators shall be direct coupled type requiring neither crank-arm nor linkage and direct mount to the associated Honeywell valve family using a threaded collar, and be removable without the use of tools.
9. Actuators shall provide plenum-rated, lead wire connections with threaded fittings for ½ inch nominal flexible conduit where mechanical protection is required by local codes.
10. Electronic valve actuators shall be capable of operating on 24 Vac, Class II power (Safety Extra-Low Voltage).

###### Control

1. The actuator shall provide two-position, floating, or modulating control. Modulating control refers to direct acceptance of 0-10 Vdc, 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 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 Vac power controlled by SPDT switch. Two-position control of fail safe actuators shall be in the form of 24 Vac power controlled by SPST switch.
2. Pneumatic actuators shall be available for ½ and ¾ inch (DN15-20) valves.
3. Globe valves shall have minimum 50:1 rangeability with an equal percentage or linear flow characteristic.
4. Globe valve proportional actuators shall have response range and travel direction selections.
5. Actuators will be available with optional spring return, fail-safe operation.

###### Other

1. All valves must be field serviceable without the need to remove the valve from the piping, in order to minimize future service costs.
2. 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.
3. 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.
4. Actuated valves shall be capable of closing off against their maximum operating differential pressure. Seat leakage when closed shall be ANSI/ASME Class III, 0.02% maximum.
5. All actuators must be able to operate from 32 to 122°F (0 to 50 C) ambient temperature, as measured at the actuator.
6. Actuators shall be constructed of materials resistant to condensation when used to control chilled water. Actuator damage due to condensation or falling water shall not be cause for warranty replacement.
7. Proportional actuators shall be designed for a minimum of 50,000 full-stroke cycles, and 1,000,000 repositions at rated load and temperature.
8. All valves and actuators shall be manufactured under ISO 9001 International Quality Control Standards.
9. Valves and actuators shall be as manufactured by Honeywell.