



**Bray Commercial**

Division of Bray Sales, Inc.

13788 West Road, Suite 200A  
Houston, Texas 77041-1300

phone: 888.412.2729  
www.bray.com

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**Section 23 09 00 – INSTRUMENTATION AND CONTROL FOR HVAC**

23 9 13 Instrumentation and Control Devices for HVAC

13.33 ACTUATORS

A. Electronic Rotary Actuators

1. Mounting: Actuators shall be capable of being mechanically and electrically paralleled to increase torque if required.
2. Overload protected electronically throughout rotation.
3. Fail Safe Operation: Shall be capable of reversible mounting for spring return to clockwise or counterclockwise direction.
4. Power Requirements: 24Vac/dc or 120Vac.
5. Temperature Rating: -4 to +122°F (-20 to +50°C)
6. Housing: Minimum requirement NEMA type 2 / IP54.
7. Agency Listings: cULus, CE or CSA
8. The manufacturer shall warrant all components for a period of 5 years from the date of production.
9. Manufactured or distributed by Bray or equal

B. Industrial Electric Actuators (*ONLY TO BE USED WITH 13.33. E Butterfly Valves – Resilient Seat and 13.33. F Butterfly Valves – High Performance.*)

1. The combination of valve and actuator shall meet the close-off requirements as specified in Section 2.16.D/E – Butterfly Valves.
2. Coupling: ISO 5211 mounting standards.
3. Overload Protection: 120VAC and 220VAC line voltage units shall have a built-in thermal overload protector with automatic reset.
4. Manual Override: Actuator shall be equipped with a declutchable hand wheel for manual operation. Engagement of the manual hand wheel shall disconnect power to the motor.
5. Actuator shall have an option to provide remote indication of manual vs. automatic mode of operation.
6. Power Requirements: 24VAC, 120VAC or 220VAC
7. Auxiliary Switches: Two SPDT rated 10A at 120 VAC or 10A at 220 VAC.
8. Temperature Rating: -20 to +150°F.(-29 to +65°C)
9. Housing: Minimum requirement NEMA type 4X/ IP65 with polyester coating. Actuator shall have an option for an internal heater to prevent condensation within the housing. A visual indication beacon shall indicate position status of the device.
10. Agency Listing: UL, CE, CSA
11. The manufacturer shall warrant for 18 months from shipment or one year from service date.
12. Bray S-70 or equal.



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### C. Pneumatic Actuators (rack and pinion type)

1. The combination of valve and actuator shall meet the close-off requirements as specified in Section 13.33. E/F – Butterfly Valves.
2. Coupling: ISO 5211 mounting standards with NAMUR accessory mounting.
3. Minimum travel range: 90° in each direction and be able to over travel at 3% in each direction with adjustable travel stops integral to housing.
4. Manual Override: Optional manual declutchable gear override assemblies.
5. Control Options: On/Off, 3-15 psi pneumatic and 4-20 mA electro-pneumatic.
6. Temperature Rating: -20 to 200°F (-29 to 95°C)
7. Housing: To be totally enclosed with no external moving parts or hoses. Shall be provided with mechanical visual position indicator, easily removable to expose the output shaft to allow manual override.
8. Bray series 92/93 or equal.

## 13.33 CONTROL VALVES

### A. Pressure Independent Control Valves

1. Valve shall always use full stroke of the control element irrespective of the maximum flow rate setting.
  - i. NPS 2" and Smaller: Valve shall have flows of 65 GPM or less, forged brass body rated at no less than 375 PSI cold working pressure with a maximum close-off of 58 psi. Body shall be brass alloy NPT threaded.
  - ii. NPS 2-1/2" through 12": Valve shall allow for flows up to 2,641 GPM with cast or ductile iron body rated for ANSI 125/150 or 250/300 working pressure with a maximum close-off rating of 116 psi. Body is to be compatible with ANSI 125/150 or 250/300 flanges.
2. Flow Regulator shall utilize a stainless-steel spring and stem for all sizes.
3. Design flow rate shall be in line field adjustable without the need for special tools or instruments.
4. Valve shall meet an ANSI Class IV leakage rating.
5. Accuracy: The control valves shall accurately control the flow from 0 to 100% rated flow with a valve body flow accuracy of +/- 10% over the full recommended differential pressure range, and +/- 5% from a differential pressure range of 5 to 50 PSI.
6. The actuators used for valves 2" and less shall have an IP54 rating or greater. The actuators for valves 2 1/2" and up shall be IP66 rated (or equivalent). Modulating actuators shall provide analog position feedback.
7. Actuator shall be factory mounted on the valve by the manufacturer. The actuator will be tagged by the manufacturer with the GPM setting and the equipment it is to be installed on. Maximum flow can be readjusted on the valve manually without the use of tools or electronic equipment. If flow setting is changed from the factory preset the actuator will not need to be reset.

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8. All pressure independent control valves shall include two P/T ports.
9. Lengths of straight pipe preceding or following the valve shall not be required for proper operation.
10. Calibrated Balancing Valves and Automatic Flow-Control Valves shall not be used on equipment where pressure independent control valves are installed.
11. Pressure Independent Control Valves shall be Bray Simple Set, Bray Simple Set Max or equal.

**B. Characterized Control Valves:**

1. NPS 2 and Smaller: Forged brass body rated at no less than 580 psi water, 15 PSIG steam, stainless steel ball and stem, female NPT end connections with a dual EPDM O-ring packing design, graphite reinforced Teflon seats, and an Amodel characterizing disc. Maximum fluid temperature rating 284<sup>0</sup>F.
2. NPS 2-1/2 through 4: Brass body with ductile iron flanges according to ANSI 150, class B, rated at 250 psi water, 25 psi steam, stainless steel ball and stainless steel stem, flange to match ANSI 150 with a dual EPDM O-ring package design, PTFE seats, and an Amodel characterizing disc. Maximum fluid temperature rating 284<sup>0</sup>F.
3. NPS 5 & 6: Brass body with ductile iron flanges according to ANSI 150, standard class B, rated at 240 psi, stainless steel ball and stainless steel stem, flange to match ANSI 150 with a dual EPDM O-ring package design, PTFE seats, and a stainless steel flow characterizing disc. Maximum fluid temperature rating 250<sup>0</sup>F.
4. Flow Characteristic: Equal percentage.
5. Leakage: ANSI Class IV (0.01%)
6. Manufactured or distributed by Bray or equal.

**C. Globe Valves:**

1. Water system globe valves:
  - i. NPS 2-1/2 and Larger: ANSI 125 cast iron flanged body, stainless steel stem, bronze trim and EPDM O-ring packing.
  - ii. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.
2. Steam system globe valves:
  - i. NPS 2-1/2 and Larger: ANSI 125 cast iron flanged body, stainless steel stem, stainless trim and EPDM O-ring packing.
  - ii. Flow Characteristics: Linear flow characteristics for both two and three way.
3. Manufactured or distributed by Bray or equal.

**D. Butterfly Valves – Resilient Seat:**

1. NPS 2 to 20: Valve body shall be full lugged cast iron 250 psig body with a nylon 11 coated or aluminum bronze disc, EPDM seat, stainless steel stem, extended neck and shall meet ANSI 125/150 flange standards. Disc-to-stem connection shall utilize a double “D” or key design

requiring no splines, screws or pins to connect stem to disc with no possible leak paths. The seat shall be tongue-and-groove with a primary hub seal and a molded O-ring suitable for weld-neck and slip on flanges

2. Sizing:
  - i. Two-Position: Line size
  - ii. Modulating: Size for the design flow with the disc in a 60-degree-open-position and a design velocity not to exceed 12 feet per second.
3. Flow Characteristics: Modified equal percentage.
4. Close-Off Pressure Rating: NPS 2-12" 175 psi bubble tight shut-off. NPS 14 and larger, 150 psi bubble tight shut-off.
5. Media Temperature Range: Water -20 to 250° F.
6. Valve shall have Pressure Equipment Directive (PED) approval.
7. Manufactured by Bray or equal.

E. Butterfly Valves – High Performance:

1. Valve body shall be full lugged carbon steel or stainless steel as required by the application, ANSI Class 150 or 300 flanged with a 316 stainless steel disc without a nylon coating, RTFE seat. Blowout-proof stem shall be 17-4ph stainless steel and shall be supported by a retaining ring installed between the machined stem groove and gland retainer step. Stem packing is adjusted via hex head nuts without having to remove the actuator. Valve body shall have long stem design to allow for 2" insulation (minimum). Valve face-to-face dimensions shall comply with API 609 and MSS-SP-68. Valve is to have replaceable seat.
2. Sizing:
  - i. Two-Position: Line size
  - ii. Modulating: Size for the design flow with the disc in a 60-degree-open-position with the design velocity less than 32 feet per second.
3. Flow Characteristics: Modified equal percentage.
4. Close-Off Pressure Rating: ANSI 150- 285 psi bubble tight shut-off; ANSI 300- 740 psi bubble tight shut-off.
5. Media Temperature Range: Water -20 to 500° F.
6. Max Differential Pressure: 285 psi @ 100° F for ANSI 150. 740 psi @ 100° F for ANSI 300.
7. Manufactured by Bray or equal.

*Select 13.13. B. Industrial Actuators or 13.13. C when specifying 13.33. E Butterfly Valves – Resilient Seat and 13.33. F Butterfly Valves – High Performance.)*