The HVA 3-Position Gate Valves are designed for use in etching, CVD, vacuum coating, FPD manufacturing and any other process that requires accurate and repeatable pressure control.

### 3 Positions - Fully open, fully closed and an adjustable third position

Smooth Transitioning from rough to high vacuum

Improved process window with user defined set points

Use with upstream Mass Flow Controllers

Throttle and Isolation combined

#### 21700 Series Standard Technical Specifications

**Materials**
- Valve body and gate: 304 stainless steel
- Welded bellows shaft seal: AM-350
- Drive shaft and pin: Hardened stainless steel

**Bonnet / gate seals**
- HV: Viton® elastomer

**Vacuum**
- Pressure Range: $1 \times 10^{-9}$ mbar
- Helium leak rate: $< 1 \times 10^{-9}$ mbar l/s
- Differential pressure closed: 1 bar in either direction
- Maximum Δ pressure before opening: ≤ 30 mbar

**Temperature**
- Body: 150°C
- Actuator: 60°C

**Mechanism**
- Pneumatic air service: 80 psig
- Solenoid: 4.0 Watts
- supplied voltage: 120V AC, 50/60 Hz
- optional voltages: 24, 200, 240 VAC 50/60 Hz
- Position indicator, max: 115 VAC or 28 VDC, 20 mA
- Reed switch for open & closed: 115 VAC, 5 A
- Microswitch for third position: 250 VA, 5 A
- optional voltages: or 28 VDC, 5 A resistive load
- 28 VDC, 3 A inductive load
- any

**Mounting Position**
- Cycles: 1,000,000 cycles
- Cycles until service: dependent on process

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Fax: (775) 359-1369
21700 Series
3-Position Throttle Valve

1. **Open**
   Solenoid A ON
   Solenoid B OFF

   When solenoid A is electrically activated, air flows through the bottom supply port directly into an air pressure regulator. The regulator is adjusted so that its output pressure is approximately 15 to 20 psi less than the input pressure. Even though it is less than full pressure, this output pressure is sufficient to open the valve.

2. **Closed**
   Solenoid A OFF
   Solenoid B OFF

   With both solenoids deactivated, air pressure is directed to the top ports. The top port of Solenoid B is plugged, so no air flows. The top port of Solenoid A is directed to the hollow top drive shaft and into the air cylinder to close the valves. This is the standard Normally Closed configuration.

3. **Partially open**
   Solenoid A ON
   Solenoid B ON

   Solenoid B does not have an air pressure regulator along its supply line, so when Solenoid B is activated, full air supply pressure is applied to the top of a separate, additional piston within the air cylinder. This adjustable piston moves down to a stop set by manually adjusting the knob at the top of the valve. The full air pressure is 15 to 20 psi more than Solenoid A pressure, so when the valve tries to open, its actuator piston meets the adjustable piston and is held at that “third position.”

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**Ordering Guides**

**3-Position with Viton Bonnet**

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<th>Inch</th>
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<th>Model number CF-F*</th>
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Includes 120V AC Solenoid. For 24V DC solenoid change 100 to 160 to **171**.

*For Metric: CF change last '0' to '4'.

**Options**

- UHV Copper Bonnet Version
- JIS, ANSI and Custom Flanges
- Alternate O-ring Materials
- Roughing Ports
- Alternate Solenoid Voltages