



VG1000 Series Flanged Ball Valves

Description

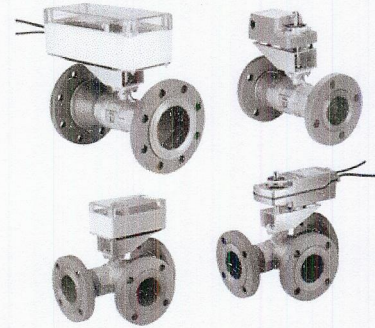
VG1000 Series Flanged Ball Valves are designed primarily to regulate the flow of hot water, chilled water, and 50% glycol solutions to the demand of a controller in Heating, Ventilating, and Air Conditioning (HVAC) systems. The valves come in sizes of 2-1/2, 3, and 4 in. (DN65, DN80, and DN100). These American Society of Mechanical Engineers (ASME) Class 150 flanged valves come in both two- and three-way configurations. Johnson Controls offers valve, linkage, and actuator assemblies for factory or field mounting with either spring return or non-spring return actuators.

If the VG1000 Series Flanged Ball Valve fails to operate within its specifications, refer to the *VG1000 Series Flanged Ball Valves Product Bulletin (LIT-12011228)* for a list of repair parts available.

Features

- Closeoff Pressure Rating: 100 psi for Two-Way Valves; 50 psi for Three-Way Valves — provides tight shutoff.
- 300 Stainless Steel Ball and Stem Assembly — applies to systems with high temperature water (0 to 284°F [-18 to 140°C]) or 25 psi saturated steam.
- 500:1 Rangeability — provides accurate control under all load conditions.

- Amodel® Flow Characterizing Disk — provides equal percentage flow characteristics for best temperature control; available in a wide array of Cv ranges to cover a broad variety of applications.
- Ethylene Propylene Diene Monomer (EPDM) Double O-Ring Stem Seal — offers tested leak-free operation for 200,000 cycles in iron-oxide contaminated water.
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals that last twice as long in iron-oxide contaminated water when compared to virgin Teflon® ball seats.
- PTFE Thermal Spacer — provides thermal isolation between the actuator and the valve.
- Seats Backed with EPDM O-Rings — maintain a constant seating force that compensates for expansion, contraction, and seat wear without increasing operating torque.
- Maintenance-Free Design — performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water.
- Available with Factory-Mounted M9124 or M9220 Series Electric Actuators — reduces field installation time and cost.



VG1000 Series Ball Valves Shown with Field Mounted M9000 Series Actuators

- M9000-330 and M9000-340 Weathershields Available for Field Installation — protect the actuator from corrosion, rain, freezing rain, sleet, and snow.

Repair Information

If the VG1000 Series Flanged Ball Valve fails to operate within its specifications, replace the unit. For a replacement valve, contact the nearest Johnson Controls® representative.

Selection Charts

Flanged Stainless Steel Trim Ball Valves with Non-Spring Return Electric Actuators

| Valve | Size, in. | Cv | Closeoff PSIG | AC 24 V | | | |
|--------------------------------------|-----------|-----------|---------------|-------------------|--------------------|-----------------------------|--------------------|
| | | | | Without Switches | | With Two Auxiliary Switches | |
| | | | | On/Off (Floating) | DC 0 to 10 V Prop. | On/Off (Floating) | DC 0 to 10 V Prop. |
| | | | | M9124-AGA-2 | M9124-GGA-2 | M9124-AGC-2 | M9124-GGC-2 |
| Two-Way – Non-Spring Return | | | | | | | |
| VG12A5GS | 2-1/2 | 47 | 100 | VG12A5GS+924AGA | VG12A5GS+924GGA | VG12A5GS+924AGC | VG12A5GS+924GCC |
| VG12A5GT | | 74 | | VG12A5GT+924AGA | VG12A5GT+924GGA | VG12A5GT+924AGC | VG12A5GT+924GCC |
| VG12A5GU | | 117 | | VG12A5GU+924AGA | VG12A5GU+924GGA | VG12A5GU+924AGC | VG12A5GU+924GCC |
| VG12A5HT | 3 | 74 | 100 | VG12A5HT+924AGA | VG12A5HT+924GGA | VG12A5HT+924AGC | VG12A5HT+924GCC |
| VG12A5HU | | 117 | | VG12A5HU+924AGA | VG12A5HU+924GGA | VG12A5HU+924AGC | VG12A5HU+924GCC |
| VG12A5HV | | 176 | | VG12A5HV+924AGA | VG12A5HV+924GGA | VG12A5HV+924AGC | VG12A5HV+924GCC |
| VG12A5HW | | 211 | | VG12A5HW+924AGA | VG12A5HW+924GGA | VG12A5HW+924AGC | VG12A5HW+924GCC |
| VG12A5JU | 4 | 117 | 100 | VG12A5JU+924AGA | VG12A5JU+924GGA | VG12A5JU+924AGC | VG12A5JU+924GCC |
| VG12A5JV | | 176 | | VG12A5JV+924AGA | VG12A5JV+924GGA | VG12A5JV+924AGC | VG12A5JV+924GCC |
| Three-Way – Non-Spring Return | | | | | | | |
| VG18A5GS | 2-1/2 | 47 / 29 | 50 | VG18A5GS+924AGA | VG18A5GS+924GGA | VG18A5GS+924AGC | VG18A5GS+924GCC |
| VG18A5GT | | 74 / 47 | | VG18A5GT+924AGA | VG18A5GT+924GGA | VG18A5GT+924AGC | VG18A5GT+924GCC |
| VG18A5GU | | 117 / 74 | | VG18A5GU+924AGA | VG18A5GU+924GGA | VG18A5GU+924AGC | VG18A5GU+924GCC |
| VG18A5HT | 3 | 74 / 47 | 50 | VG18A5HT+924AGA | VG18A5HT+924GGA | VG18A5HT+924AGC | VG18A5HT+924GCC |
| VG18A5HU | | 117 / 74 | | VG18A5HU+924AGA | VG18A5HU+924GGA | VG18A5HU+924AGC | VG18A5HU+924GCC |
| VG18A5HV | | 176 / 88 | | VG18A5HV+924AGA | VG18A5HV+924GGA | VG18A5HV+924AGC | VG18A5HV+924GCC |
| VG18A5HW | | 211 / 105 | | VG18A5HW+924AGA | VG18A5HW+924GGA | VG18A5HW+924AGC | VG18A5HW+924GCC |
| VG18A5JU | 4 | 117 / 74 | 50 | VG18A5JU+924AGA | VG18A5JU+924GGA | VG18A5JU+924AGC | VG18A5JU+924GCC |
| VG18A5JV | | 176 / 88 | | VG18A5JV+924AGA | VG18A5JV+924GGA | VG18A5JV+924AGC | VG18A5JV+924GCC |

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 West Chester, PA 19382
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VG1000 Series Flanged Ball Valves (Continued)

Flanged Stainless Steel Trim Ball Valves with Spring Return Electric Actuators without Switches

| Valve | Size, in. | Cv | Closeoff PSIG | AC 24 V | | | AC 120 V |
|---|-----------|-----------|---------------|-----------------|---------------------------|-----------------|-----------------|
| | | | | Floating | DC 0 to 10 V Proportional | On/Off | On/Off |
| | | | | M9220-AGA-3 | M9220-GGA-3 | M9220-BGA--3 | M9220-BAA-3 |
| Two-Way –Spring Return– Valve Open (Normally Open) – without Switches | | | | | | | |
| VG12A5GS | 2-1/2 | 47 | 100 | VG12A5GS+92NAGA | VG12A5GS+92NGGA | VG12A5GS+92NBGA | VG12A5GS+92NBAA |
| VG12A5GT | | 74 | | VG12A5GT+92NAGA | VG12A5GT+92NGGA | VG12A5GT+92NBGA | VG12A5GT+92NBAA |
| VG12A5GU | | 117 | | VG12A5GU+92NAGA | VG12A5GU+92NGGA | VG12A5GU+92NBGA | VG12A5GU+92NBAA |
| VG12A5HT | 3 | 74 | 100 | VG12A5HT+92NAGA | VG12A5HT+92NGGA | VG12A5HT+92NBGA | VG12A5HT+92NBAA |
| VG12A5HU | | 117 | | VG12A5HU+92NAGA | VG12A5HU+92NGGA | VG12A5HU+92NBGA | VG12A5HU+92NBAA |
| VG12A5HV | | 176 | | VG12A5HV+92NAGA | VG12A5HV+92NGGA | VG12A5HV+92NBGA | VG12A5HV+92NBAA |
| VG12A5HW | | 211 | | VG12A5HW+92NAGA | VG12A5HW+92NGGA | VG12A5HW+92NBGA | VG12A5HW+92NBAA |
| VG12A5JU | 4 | 117 | 100 | VG12A5JU+92NAGA | VG12A5JU+92NGGA | VG12A5JU+92NBGA | VG12A5JU+92NBAA |
| VG12A5JV | | 176 | | VG12A5JV+92NAGA | VG12A5JV+92NGGA | VG12A5JV+92NBGA | VG12A5JV+92NBAA |
| Two-Way –Spring Return – Valve Closed (Normally Closed) – without Switches | | | | | | | |
| VG12A5GS | 2-1/2 | 47 | 100 | VG12A5GS+94NAGA | VG12A5GS+94NGGA | VG12A5GS+94NBGA | VG12A5GS+94NBAA |
| VG12A5GT | | 74 | | VG12A5GT+94NAGA | VG12A5GT+94NGGA | VG12A5GT+94NBGA | VG12A5GT+94NBAA |
| VG12A5GU | | 117 | | VG12A5GU+94NAGA | VG12A5GU+94NGGA | VG12A5GU+94NBGA | VG12A5GU+94NBAA |
| VG12A5HT | 3 | 74 | 100 | VG12A5HT+94NAGA | VG12A5HT+94NGGA | VG12A5HT+94NBGA | VG12A5HT+94NBAA |
| VG12A5HU | | 117 | | VG12A5HU+94NAGA | VG12A5HU+94NGGA | VG12A5HU+94NBGA | VG12A5HU+94NBAA |
| VG12A5HV | | 176 | | VG12A5HV+94NAGA | VG12A5HV+94NGGA | VG12A5HV+94NBGA | VG12A5HV+94NBAA |
| VG12A5HW | | 211 | | VG12A5HW+94NAGA | VG12A5HW+94NGGA | VG12A5HW+94NBGA | VG12A5HW+94NBAA |
| VG12A5JU | 4 | 117 | 100 | VG12A5JU+94NAGA | VG12A5JU+94NGGA | VG12A5JU+94NBGA | VG12A5JU+94NBAA |
| VG12A5JV | | 176 | | VG12A5JV+94NAGA | VG12A5JV+94NGGA | VG12A5JV+94NBGA | VG12A5JV+94NBAA |
| Three-Way – Spring Return Counterclockwise – Port A (Coil) Open to Port AB (Common) – without Switches | | | | | | | |
| VG18A5GS | 2-1/2 | 47 / 29 | 50 | VG18A5GS+92NAGA | VG18A5GS+92NGGA | VG18A5GS+92NBGA | VG18A5GS+92NBAA |
| VG18A5GT | | 74 / 47 | | VG18A5GT+92NAGA | VG18A5GT+92NGGA | VG18A5GT+92NBGA | VG18A5GT+92NBAA |
| VG18A5GU | | 117 / 74 | | VG18A5GU+92NAGA | VG18A5GU+92NGGA | VG18A5GU+92NBGA | VG18A5GU+92NBAA |
| VG18A5HT | 3 | 74 / 47 | 50 | VG18A5HT+92NAGA | VG18A5HT+92NGGA | VG18A5HT+92NBGA | VG18A5HT+92NBAA |
| VG18A5HU | | 117 / 74 | | VG18A5HU+92NAGA | VG18A5HU+92NGGA | VG18A5HU+92NBGA | VG18A5HU+92NBAA |
| VG18A5HV | | 176 / 88 | | VG18A5HV+92NAGA | VG18A5HV+92NGGA | VG18A5HV+92NBGA | VG18A5HV+92NBAA |
| VG18A5HW | | 211 / 105 | | VG18A5HW+92NAGA | VG18A5HW+92NGGA | VG18A5HW+92NBGA | VG18A5HW+92NBAA |
| VG18A5JU | 4 | 117 / 74 | 50 | VG18A5JU+92NAGA | VG18A5JU+92NGGA | VG18A5JU+92NBGA | VG18A5JU+92NBAA |
| VG18A5JV | | 176 / 88 | | VG18A5JV+92NAGA | VG18A5JV+92NGGA | VG18A5JV+92NBGA | VG18A5JV+92NBAA |
| Three-Way – Spring Return Clockwise – Port B (Bypass) Open to Port AB (Common) – without Switches | | | | | | | |
| VG18A5GS | 2-1/2 | 47 / 29 | 50 | VG18A5GS+94NAGA | VG18A5GS+94NGGA | VG18A5GS+94NBGA | VG18A5GS+94NBAA |
| VG18A5GT | | 74 / 47 | | VG18A5GT+94NAGA | VG18A5GT+94NGGA | VG18A5GT+94NBGA | VG18A5GT+94NBAA |
| VG18A5GU | | 117 / 74 | | VG18A5GU+94NAGA | VG18A5GU+94NGGA | VG18A5GU+94NBGA | VG18A5GU+94NBAA |
| VG18A5HT | 3 | 74 / 47 | 50 | VG18A5HT+94NAGA | VG18A5HT+94NGGA | VG18A5HT+94NBGA | VG18A5HT+94NBAA |
| VG18A5HU | | 117 / 74 | | VG18A5HU+94NAGA | VG18A5HU+94NGGA | VG18A5HU+94NBGA | VG18A5HU+94NBAA |
| VG18A5HV | | 176 / 88 | | VG18A5HV+94NAGA | VG18A5HV+94NGGA | VG18A5HV+94NBGA | VG18A5HV+94NBAA |
| VG18A5HW | | 211 / 105 | | VG18A5HW+94NAGA | VG18A5HW+94NGGA | VG18A5HW+94NBGA | VG18A5HW+94NBAA |
| VG18A5JU | 4 | 117 / 74 | 50 | VG18A5JU+94NAGA | VG18A5JU+94NGGA | VG18A5JU+94NBGA | VG18A5JU+94NBAA |
| VG18A5JV | | 176 / 88 | | VG18A5JV+94NAGA | VG18A5JV+94NGGA | VG18A5JV+94NBGA | VG18A5JV+94NBAA |

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VG1000 Series Flanged Ball Valves (Continued)

Flanged Stainless Steel Trim Ball Valves with Spring Return Electric Actuators with Two Switches

| Valve | Size, in. | Cv | Closeoff PSIG | AC 24 V | | | AC 120 V |
|--|-----------|-----------|---------------|-----------------|--------------------------|-----------------|-----------------|
| | | | | Floating | 0 to 10 VDC Proportional | On/Off | On/Off |
| | | | | M9220-AGC-3 | M9220-GGC-3 | M9220-BGC-3 | M9220-BAC-3 |
| Two-Way – Spring Return – Valve Open (Normally Open) – with Two Auxiliary Switches | | | | | | | |
| VG12A5GS | 2-1/2 | 47 | 100 | VG12A5GS+92NAGC | VG12A5GS+92NGGC | VG12A5GS+92NBGC | VG12A5GS+92NBAC |
| VG12A5GT | | 74 | | VG12A5GT+92NAGC | VG12A5GT+92NGGC | VG12A5GT+92NBGC | VG12A5GT+92NBAC |
| VG12A5GU | | 117 | | VG12A5GU+92NAGC | VG12A5GU+92NGGC | VG12A5GU+92NBGC | VG12A5GU+92NBAC |
| VG12A5HT | 3 | 74 | 100 | VG12A5HT+92NAGC | VG12A5HT+92NGGC | VG12A5HT+92NBGC | VG12A5HT+92NBAC |
| VG12A5HU | | 117 | | VG12A5HU+92NAGC | VG12A5HU+92NGGC | VG12A5HU+92NBGC | VG12A5HU+92NBAC |
| VG12A5HV | | 176 | | VG12A5HV+92NAGC | VG12A5HV+92NGGC | VG12A5HV+92NBGC | VG12A5HV+92NBAC |
| VG12A5HW | | 211 | | VG12A5HW+92NAGC | VG12A5HW+92NGGC | VG12A5HW+92NBGC | VG12A5HW+92NBAC |
| VG12A5JU | 4 | 117 | 100 | VG12A5JU+92NAGC | VG12A5JU+92NGGC | VG12A5JU+92NBGC | VG12A5JU+92NBAC |
| VG12A5JV | | 176 | | VG12A5JV+92NAGC | VG12A5JV+92NGGC | VG12A5JV+92NBGC | VG12A5JV+92NBAC |
| Two-Way – Spring Return – Valve Closed (Normally Closed) – with Two Auxiliary Switches | | | | | | | |
| VG12A5GS | 2-1/2 | 47 | 100 | VG12A5GS+94NAGC | VG12A5GS+94NGGC | VG12A5GS+94NBGC | VG12A5GS+94NBAC |
| VG12A5GT | | 74 | | VG12A5GT+94NAGC | VG12A5GT+94NGGC | VG12A5GT+94NBGC | VG12A5GT+94NBAC |
| VG12A5GU | | 117 | | VG12A5GU+94NAGC | VG12A5GU+94NGGC | VG12A5GU+94NBGC | VG12A5GU+94NBAC |
| VG12A5HT | 3 | 74 | 100 | VG12A5HT+94NAGC | VG12A5HT+94NGGC | VG12A5HT+94NBGC | VG12A5HT+94NBAC |
| VG12A5HU | | 117 | | VG12A5HU+94NAGC | VG12A5HU+94NGGC | VG12A5HU+94NBGC | VG12A5HU+94NBAC |
| VG12A5HV | | 176 | | VG12A5HV+94NAGC | VG12A5HV+94NGGC | VG12A5HV+94NBGC | VG12A5HV+94NBAC |
| VG12A5HW | | 211 | | VG12A5HW+94NAGC | VG12A5HW+94NGGC | VG12A5HW+94NBGC | VG12A5HW+94NBAC |
| VG12A5JU | 4 | 117 | 100 | VG12A5JU+94NAGC | VG12A5JU+94NGGC | VG12A5JU+94NBGC | VG12A5JU+94NBAC |
| VG12A5JV | | 176 | | VG12A5JV+94NAGC | VG12A5JV+94NGGC | VG12A5JV+94NBGC | VG12A5JV+94NBAC |
| Three-Way – Spring Return Counterclockwise – Port A (Coil) Open to Port AB (Common) – with Two Auxiliary Switches | | | | | | | |
| VG18A5GS | 2-1/2 | 47 / 29 | 50 | VG18A5GS+92NAGC | VG18A5GS+92NGGC | VG18A5GS+92NBGC | VG18A5GS+92NBAC |
| VG18A5GT | | 74 / 47 | | VG18A5GT+92NAGC | VG18A5GT+92NGGC | VG18A5GT+92NBGC | VG18A5GT+92NBAC |
| VG18A5GU | | 117 / 74 | | VG18A5GU+92NAGC | VG18A5GU+92NGGC | VG18A5GU+92NBGC | VG18A5GU+92NBAC |
| VG18A5HT | 3 | 74 / 47 | 50 | VG18A5HT+92NAGC | VG18A5HT+92NGGC | VG18A5HT+92NBGC | VG18A5HT+92NBAC |
| VG18A5HU | | 117 / 74 | | VG18A5HU+92NAGC | VG18A5HU+92NGGC | VG18A5HU+92NBGC | VG18A5HU+92NBAC |
| VG18A5HV | | 176 / 88 | | VG18A5HV+92NAGC | VG18A5HV+92NGGC | VG18A5HV+92NBGC | VG18A5HV+92NBAC |
| VG18A5HW | | 211 / 105 | | VG18A5HW+92NAGC | VG18A5HW+92NGGC | VG18A5HW+92NBGC | VG18A5HW+92NBAC |
| VG18A5JU | 4 | 117 / 74 | 50 | VG18A5JU+92NAGC | VG18A5JU+92NGGC | VG18A5JU+92NBGC | VG18A5JU+92NBAC |
| VG18A5JV | | 176 / 88 | | VG18A5JV+92NAGC | VG18A5JV+92NGGC | VG18A5JV+92NBGC | VG18A5JV+92NBAC |
| Three-Way – Spring Return Clockwise – Port B (Bypass) Open to Port AB (Common) – with Two Auxiliary Switches | | | | | | | |
| VG18A5GS | 2-1/2 | 47 / 29 | 50 | VG18A5GS+94NAGC | VG18A5GS+94NGGC | VG18A5GS+94NBGC | VG18A5GS+94NBAC |
| VG18A5GT | | 74 / 47 | | VG18A5GT+94NAGC | VG18A5GT+94NGGC | VG18A5GT+94NBGC | VG18A5GT+94NBAC |
| VG18A5GU | | 117 / 74 | | VG18A5GU+94NAGC | VG18A5GU+94NGGC | VG18A5GU+94NBGC | VG18A5GU+94NBAC |
| VG18A5HT | 3 | 74 / 47 | 50 | VG18A5HT+94NAGC | VG18A5HT+94NGGC | VG18A5HT+94NBGC | VG18A5HT+94NBAC |
| VG18A5HU | | 117 / 74 | | VG18A5HU+94NAGC | VG18A5HU+94NGGC | VG18A5HU+94NBGC | VG18A5HU+94NBAC |
| VG18A5HV | | 176 / 88 | | VG18A5HV+94NAGC | VG18A5HV+94NGGC | VG18A5HV+94NBGC | VG18A5HV+94NBAC |
| VG18A5HW | | 211 / 105 | | VG18A5HW+94NAGC | VG18A5HW+94NGGC | VG18A5HW+94NBGC | VG18A5HW+94NBAC |
| VG18A5JU | 4 | 117 / 74 | 50 | VG18A5JU+94NAGC | VG18A5JU+94NGGC | VG18A5JU+94NBGC | VG18A5JU+94NBAC |
| VG18A5JV | | 176 / 88 | | VG18A5JV+94NAGC | VG18A5JV+94NGGC | VG18A5JV+94NBGC | VG18A5JV+94NBAC |

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VG1000 Series Flanged Ball Valves (Continued)

Technical Specifications

VG1000 Series Flanged Ball Valves

| | | |
|--|--------------------------|---|
| Service¹ | | Hot Water, Chilled Water, 50/50 Glycol Solutions, and 25 psig (172 kPa) Saturated Steam for HVAC Systems |
| Valve Fluid Temperature Limits | | 0 to 284°F (-18 to 140°C) |
| Valve Body Pressure/ Temperature Rating | Water | ASME Class 150 250 psi at -20 to 100°F (29 to 38°C) 235 psi at: 200°F (93°C) 218 psi at: 284°F (140°C) |
| | Steam | 25 psig (172 kPa) Saturated Steam for HVAC Systems |
| Maximum Closeoff Pressure | Two-Way | 100 psi (689 kPa) |
| | Three-Way | 50 psi (345 kPa) |
| Maximum Recommended Operating Pressure Drop | | 30 psi (207 kPa) for quiet service |
| Flow Characteristics | Two-Way | Equal Percentage |
| | Three-Way | Equal Percentage Flow Characteristics of In-line Port or Linear Percentage Flow Characteristics of Angle Port |
| Rangeability² | | Greater than 500:1 |
| Leakage | Two- or Three-Way | 0.01% of Maximum Flow, Control Port, ANSI/FCI 70-2, Class 4 |
| | Three-Way | 1% of Maximum Flow, Bypass Port |
| End Connections | | ASME Class 150 Flange |
| Minimum Ambient Operating Temperature | -4°F (-20°C) | M9124 Series Non-Spring Return Actuators |
| | -40°F (-40°C) | M9220 Series Spring Return Actuators |
| Maximum Ambient Operating Temperature³ | 122°F (50°C) | M9124 Series Non-Spring Return Actuators |
| | 131°F (55°C) | M9220 Series Spring Return Actuators |
| Materials | Body | Brass |
| | Flanges | Ductile Iron |
| | Ball | 300 Series Stainless Steel |
| | Stem | 300 Series Stainless Steel |
| | Seats | Graphite Reinforced PTFE with EPDM O-Ring Backing |
| | Stem Seals | EPDM O-Rings |
| | Flow Control Disk | Amodel AS-1145HS Polyphthalamide Resin |

1. Refer to VDI 2035 Standard for proper water treatment.
2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.
3. In steam applications, install the valve with the stem horizontal to the piping and wrap the valve and piping with insulation.