

## VG1000 Series Flanged Ball Valves

### Description

The VG1000 Series Flanged Ball Valves are primarily designed to regulate the flow of hot water, chilled water, and 50/50 glycol solutions to the demand of a controller in HVAC systems. The valves come in sizes of 2-1/2 in., 3 in., 4 in., 5 in., and 6 in. 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.

Refer to the *VG1000 Series Flanged Ball Valves Product Bulletin (LIT-12011228)* for important product application information and single point of contact information.

### 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°F to 284°F [-18°C 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 VA9320 or M9220 Series Electric Actuators — reduces field installation time and cost.

### VG1000 Series Ball Valves Shown with Field Mounted VA9320 and M9220 Series Actuators



- Weather Shields Available for Field Installation — protect the actuator from corrosion, rain, freezing rain, sleet, and snow.

### Repair Information

If the VG1000 Series Ball Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls® representative.

### Selection Charts

#### Flanged Stainless Steel Trim Ball Valves with Non-Spring Return Electric Actuators (Part 1 of 2)

| Valve    | Size,<br>in. | Cv              | Closeoff<br>PSIG | AC and DC 24 V                     |                                               |
|----------|--------------|-----------------|------------------|------------------------------------|-----------------------------------------------|
|          |              |                 |                  | On/Off, Floating, and Proportional | On/Off, Floating, and Proportional            |
|          |              |                 |                  | Without Switches                   | With Two Auxiliary Switches                   |
|          |              |                 |                  | VA9320-HGA-2 Actuator              | VA9320-HGA-2 Actuator with M9300-2 Switch Kit |
| Two-Way  |              |                 |                  |                                    |                                               |
| VG12A5GS | 2-1/2        | 47              | 100              | VG12A5GS+920HGA                    | VG12A5GS+920HGC                               |
| VG12A5KS |              | 74              |                  | VG12A5KS+920HGA                    | VG12A5KS+920HGC                               |
| VG12A5GT |              |                 |                  | VG12A5GT+920HGA                    | VG12A5GT+920HGC                               |
| VG12A5KT |              |                 |                  | VG12A5KT+920HGA                    | VG12A5KT+920HGC                               |
| VG12A5GU |              |                 |                  | 117                                | VG12A5GU+920HGA                               |
| VG12A5KU |              | VG12A5KU+920HGA |                  |                                    | VG12A5KU+920HGC                               |
| VG12A5HT | 3            | 74              | 100              | VG12A5HT+920HGA                    | VG12A5HT+920HGC                               |
| VG12A5LT |              | 117             |                  | VG12A5LT+920HGA                    | VG12A5LT+920HGC                               |
| VG12A5HU |              |                 |                  | VG12A5HU+920HGA                    | VG12A5HU+920HGC                               |
| VG12A5LU |              |                 |                  | VG12A5LU+920HGA                    | VG12A5LU+920HGC                               |
| VG12A5HV |              |                 |                  | 176                                | VG12A5HV+920HGA                               |
| VG12A5LV |              | VG12A5LV+920HGA |                  |                                    | VG12A5LV+920HGC                               |
| VG12A5HW |              | 211             |                  | VG12A5HW+920HGA                    | VG12A5HW+920HGC                               |
| VG12A5LW |              |                 |                  | VG12A5LW+920HGA                    | VG12A5LW+920HGC                               |

## VG1000 Series Flanged Ball Valves (Continued)

### Flanged Stainless Steel Trim Ball Valves with Non-Spring Return Electric Actuators (Part 2 of 2)

| Valve     | Size,<br>in. | Cv        | Closeoff<br>PSIG | AC and DC 24 V                     |                                               |
|-----------|--------------|-----------|------------------|------------------------------------|-----------------------------------------------|
|           |              |           |                  | On/Off, Floating, and Proportional | On/Off, Floating, and Proportional            |
|           |              |           |                  | Without Switches                   | With Two Auxiliary Switches                   |
|           |              |           |                  | VA9320-HGA-2 Actuator              | VA9320-HGA-2 Actuator with M9300-2 Switch Kit |
| VG12A5JU  | 4            | 117       | 100              | VG12A5JU+920HGA                    | VG12A5JU+920HGC                               |
| VG12A5JV  |              | 176       |                  | VG12A5JV+920HGA                    | VG12A5JV+920HGC                               |
| VG12A5MW  |              | 190       |                  | VG12A5MW+920HGA                    | VG12A5MW+920HGC                               |
| VG12A5NY  | 5            | 290       |                  | VG12A5NY+920HGA                    | VG12A5NY+920HGC                               |
| VG12A5PZ  | 6            | 350       |                  | VG12A5PZ+920HGA                    | VG12A5PZ+920HGC                               |
| Three-Way |              |           |                  |                                    |                                               |
| VG18A5GS  | 2-1/2        | 47 / 29   | 50               | VG18A5GS+920HGA                    | VG18A5GS+920HGC                               |
| VG18A5KS  |              | 74 / 47   |                  | VG18A5KS+920HGA                    | VG18A5KS+920HGC                               |
| VG18A5GT  |              |           |                  | VG18A5GT+920HGA                    | VG18A5GT+920HGC                               |
| VG18A5KT  |              |           |                  | VG18A5KT+920HGA                    | VG18A5KT+920HGC                               |
| VG18A5GU  |              | 117 / 74  |                  | VG18A5GU+920HGA                    | VG18A5GU+920HGC                               |
| VG18A5KU  |              |           |                  | VG18A5KU+920HGA                    | VG18A5KU+920HGC                               |
| VG18A5HT  | 3            | 74 / 47   | 50               | VG18A5HT+920HGA                    | VG18A5HT+920HGC                               |
| VG18A5LT  |              | 117 / 74  |                  | VG18A5LT+920HGA                    | VG18A5LT+920HGC                               |
| VG18A5HU  |              |           |                  | VG18A5HU+920HGA                    | VG18A5HU+920HGC                               |
| VG18A5LU  |              |           |                  | VG18A5LU+920HGA                    | VG18A5LU+920HGC                               |
| VG18A5HV  |              | 176 / 88  |                  | VG18A5HV+920HGA                    | VG18A5HV+920HGC                               |
| VG18A5LV  |              |           |                  | VG18A5LV+920HGA                    | VG18A5LV+920HGC                               |
| VG18A5HW  |              | 211 / 105 |                  | VG18A5HW+920HGA                    | VG18A5HW+920HGC                               |
| VG18A5LW  |              |           |                  | VG18A5LW+920HGA                    | VG18A5LW+920HGC                               |
| VG18A5JU  | 4            | 117 / 74  | 50               | VG18A5JU+920HGA                    | VG18A5JU+920HGC                               |
| VG18A5JV  |              | 176 / 88  |                  | VG18A5JV+920HGA                    | VG18A5JV+920HGC                               |
| VG18A5MW  |              | 190 / 190 |                  | VG18A5MW+920HGA                    | VG18A5MW+920HGC                               |
| VG18A5NY  | 5            | 290 / 190 |                  | VG18A5NY+920HGA                    | VG18A5NY+920HGC                               |
| VG18A5PZ  | 6            | 350 / 180 |                  | VG18A5PZ+920HGA                    | VG18A5PZ+920HGC                               |

## VG1000 Series Flanged Ball Valves (Continued)

### Flanged Stainless Steel Trim Ball Valves with Spring Return Electric Actuators without Switches (Part 1 of 2)

| Valve                                                                       | Size,<br>in. | Cv  | Closeoff<br>PSIG | AC 24 V         |                    |                 | AC 120 V        |
|-----------------------------------------------------------------------------|--------------|-----|------------------|-----------------|--------------------|-----------------|-----------------|
|                                                                             |              |     |                  | Floating        | DC 0 to 10 V Prop. | 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 |
| VG12A5KS                                                                    |              | 74  |                  | VG12A5KS+92NAGA | VG12A5KS+92NGGA    | VG12A5KS+92NBGA | VG12A5KS+92NBAA |
| VG12A5GT                                                                    |              |     |                  | VG12A5GT+92NAGA | VG12A5GT+92NGGA    | VG12A5GT+92NBGA | VG12A5GT+92NBAA |
| VG12A5KT                                                                    |              |     |                  | VG12A5KT+92NAGA | VG12A5KT+92NGGA    | VG12A5KT+92NBGA | VG12A5KT+92NBAA |
| VG12A5GU                                                                    |              | 117 |                  | VG12A5GU+92NAGA | VG12A5GU+92NGGA    | VG12A5GU+92NBGA | VG12A5GU+92NBAA |
| VG12A5KU                                                                    |              |     |                  | VG12A5KU+92NAGA | VG12A5KU+92NGGA    | VG12A5KU+92NBGA | VG12A5KU+92NBAA |
| VG12A5HT                                                                    | 3            | 74  | 100              | VG12A5HT+92NAGA | VG12A5HT+92NGGA    | VG12A5HT+92NBGA | VG12A5HT+92NBAA |
| VG12A5LT                                                                    |              | 117 |                  | VG12A5LT+92NAGA | VG12A5LT+92NGGA    | VG12A5LT+92NBGA | VG12A5LT+92NBAA |
| VG12A5HU                                                                    |              |     |                  | VG12A5HU+92NAGA | VG12A5HU+92NGGA    | VG12A5HU+92NBGA | VG12A5HU+92NBAA |
| VG12A5LU                                                                    |              |     |                  | VG12A5LU+92NAGA | VG12A5LU+92NGGA    | VG12A5LU+92NBGA | VG12A5LU+92NBAA |
| VG12A5HV                                                                    |              | 176 |                  | VG12A5HV+92NAGA | VG12A5HV+92NGGA    | VG12A5HV+92NBGA | VG12A5HV+92NBAA |
| VG12A5LV                                                                    |              |     |                  | VG12A5LV+92NAGA | VG12A5LV+92NGGA    | VG12A5LV+92NBGA | VG12A5LV+92NBAA |
| VG12A5HW                                                                    |              | 211 |                  | VG12A5HW+92NAGA | VG12A5HW+92NGGA    | VG12A5HW+92NBGA | VG12A5HW+92NBAA |
| VG12A5LW                                                                    |              |     |                  | VG12A5LW+92NAGA | VG12A5LW+92NGGA    | VG12A5LW+92NBGA | VG12A5LW+92NBAA |
| VG12A5JU                                                                    | 4            | 117 | 100              | VG12A5JU+92NAGA | VG12A5JU+92NGGA    | VG12A5JU+92NBGA | VG12A5JU+92NBAA |
| VG12A5JV                                                                    |              | 176 |                  | VG12A5JV+92NAGA | VG12A5JV+92NGGA    | VG12A5JV+92NBGA | VG12A5JV+92NBAA |
| VG12A5MW                                                                    |              | 190 |                  | VG12A5MW+92NAGA | VG12A5MW+92NGGA    | VG12A5MW+92NBGA | VG12A5MW+92NBAA |
| VG12A5NY                                                                    | 5            | 290 | 100              | VG12A5NY+92NAGA | VG12A5NY+92NGGA    | VG12A5NY+92NBGA | VG12A5NY+92NBAA |
| VG12A5PZ                                                                    | 6            | 350 |                  | VG12A5PZ+92NAGA | VG12A5PZ+92NGGA    | VG12A5PZ+92NBGA | VG12A5PZ+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 |
| VG12A5KS                                                                    |              | 74  |                  | VG12A5KS+94NAGA | VG12A5KS+94NGGA    | VG12A5KS+94NBGA | VG12A5KS+94NBAA |
| VG12A5GT                                                                    |              |     |                  | VG12A5GT+94NAGA | VG12A5GT+94NGGA    | VG12A5GT+94NBGA | VG12A5GT+94NBAA |
| VG12A5KT                                                                    |              |     |                  | VG12A5KT+94NAGA | VG12A5KT+94NGGA    | VG12A5KT+94NBGA | VG12A5KT+94NBAA |
| VG12A5GU                                                                    |              | 117 |                  | VG12A5GU+94NAGA | VG12A5GU+94NGGA    | VG12A5GU+94NBGA | VG12A5GU+94NBAA |
| VG12A5KU                                                                    |              |     |                  | VG12A5KU+94NAGA | VG12A5KU+94NGGA    | VG12A5KU+94NBGA | VG12A5KU+94NBAA |
| VG12A5HT                                                                    | 3            | 74  | 100              | VG12A5HT+94NAGA | VG12A5HT+94NGGA    | VG12A5HT+94NBGA | VG12A5HT+94NBAA |
| VG12A5LT                                                                    |              | 117 |                  | VG12A5LT+94NAGA | VG12A5LT+94NGGA    | VG12A5LT+94NBGA | VG12A5LT+94NBAA |
| VG12A5HU                                                                    |              |     |                  | VG12A5HU+94NAGA | VG12A5HU+94NGGA    | VG12A5HU+94NBGA | VG12A5HU+94NBAA |
| VG12A5LU                                                                    |              |     |                  | VG12A5LU+94NAGA | VG12A5LU+94NGGA    | VG12A5LU+94NBGA | VG12A5LU+94NBAA |
| VG12A5HV                                                                    |              | 176 |                  | VG12A5HV+94NAGA | VG12A5HV+94NGGA    | VG12A5HV+94NBGA | VG12A5HV+94NBAA |
| VG12A5LV                                                                    |              |     |                  | VG12A5LV+94NAGA | VG12A5LV+94NGGA    | VG12A5LV+94NBGA | VG12A5LV+94NBAA |
| VG12A5HW                                                                    |              | 211 |                  | VG12A5HW+94NAGA | VG12A5HW+94NGGA    | VG12A5HW+94NBGA | VG12A5HW+94NBAA |
| VG12A5LW                                                                    |              |     |                  | VG12A5LW+94NAGA | VG12A5LW+94NGGA    | VG12A5LW+94NBGA | VG12A5LW+94NBAA |
| VG12A5JU                                                                    | 4            | 117 | 100              | VG12A5JU+94NAGA | VG12A5JU+94NGGA    | VG12A5JU+94NBGA | VG12A5JU+94NBAA |
| VG12A5JV                                                                    |              | 176 |                  | VG12A5JV+94NAGA | VG12A5JV+94NGGA    | VG12A5JV+94NBGA | VG12A5JV+94NBAA |
| VG12A5MW                                                                    |              | 190 |                  | VG12A5MW+94NAGA | VG12A5MW+94NGGA    | VG12A5MW+94NBGA | VG12A5MW+94NBAA |
| VG12A5NY                                                                    | 5            | 290 | 100              | VG12A5NY+94NAGA | VG12A5NY+94NGGA    | VG12A5NY+94NBGA | VG12A5NY+94NBAA |
| VG12A5PZ                                                                    | 6            | 350 |                  | VG12A5PZ+94NAGA | VG12A5PZ+94NGGA    | VG12A5PZ+94NBGA | VG12A5PZ+94NBAA |

## VG1000 Series Flanged Ball Valves (Continued)

### Flanged Stainless Steel Trim Ball Valves with Spring Return Electric Actuators without Switches (Part 2 of 2)

| Valve                                                                                                  | Size,<br>in. | Cv        | Closeoff<br>PSIG | AC 24 V         |                    |                 | AC 120 V        |
|--------------------------------------------------------------------------------------------------------|--------------|-----------|------------------|-----------------|--------------------|-----------------|-----------------|
|                                                                                                        |              |           |                  | Floating        | DC 0 to 10 V Prop. | On/Off          | On/Off          |
|                                                                                                        |              |           |                  | M9220-AGA-3     | M9220-GGA-3        | M9220-BGA-3     | M9220-BAA-3     |
| 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 |
| VG18A5K                                                                                                |              | 74 / 47   |                  | VG18A5KS+92NAGA | VG18A5KS+92NGGA    | VG18A5KS+92NBGA | VG18A5KS+92NBAA |
| VG18A5GT                                                                                               |              |           |                  | VG18A5GT+92NAGA | VG18A5GT+92NGGA    | VG18A5GT+92NBGA | VG18A5GT+92NBAA |
| VG18A5KT                                                                                               |              |           |                  | VG18A5KT+92NAGA | VG18A5KT+92NGGA    | VG18A5KT+92NBGA | VG18A5KT+92NBAA |
| VG18A5GU                                                                                               |              | 117 / 74  |                  | VG18A5GU+92NAGA | VG18A5GU+92NGGA    | VG18A5GU+92NBGA | VG18A5GU+92NBAA |
| VG18A5KU                                                                                               |              |           |                  | VG18A5KU+92NAGA | VG18A5KU+92NGGA    | VG18A5KU+92NBGA | VG18A5KU+92NBAA |
| VG18A5HT                                                                                               | 3            | 74 / 47   | 50               | VG18A5HT+92NAGA | VG18A5HT+92NGGA    | VG18A5HT+92NBGA | VG18A5HT+92NBAA |
| VG18A5LT                                                                                               |              | 117 / 74  |                  | VG18A5LT+92NAGA | VG18A5LT+92NGGA    | VG18A5LT+92NBGA | VG18A5LT+92NBAA |
| VG18A5HU                                                                                               |              |           |                  | VG18A5HU+92NAGA | VG18A5HU+92NGGA    | VG18A5HU+92NBGA | VG18A5HU+92NBAA |
| VG18A5LU                                                                                               |              |           |                  | VG18A5LU+92NAGA | VG18A5LU+92NGGA    | VG18A5LU+92NBGA | VG18A5LU+92NBAA |
| VG18A5HV                                                                                               |              | 176 / 88  |                  | VG18A5HV+92NAGA | VG18A5HV+92NGGA    | VG18A5HV+92NBGA | VG18A5HV+92NBAA |
| VG18A5LV                                                                                               |              |           |                  | VG18A5LV+92NAGA | VG18A5LV+92NGGA    | VG18A5LV+92NBGA | VG18A5LV+92NBAA |
| VG18A5HW                                                                                               |              | 211 / 105 |                  | VG18A5HW+92NAGA | VG18A5HW+92NGGA    | VG18A5HW+92NBGA | VG18A5HW+92NBAA |
| VG18A5LW                                                                                               |              |           |                  | VG18A5LW+92NAGA | VG18A5LW+92NGGA    | VG18A5LW+92NBGA | VG18A5LW+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 |
| VG18A5MW                                                                                               |              | 190 / 190 |                  | VG18A5MW+92NAGA | VG18A5MW+92NGGA    | VG18A5MW+92NBGA | VG18A5MW+92NBAA |
| VG18A5NY                                                                                               | 5            | 290 / 190 |                  | VG18A5NY+92NAGA | VG18A5NY+92NGGA    | VG18A5NY+92NBGA | VG18A5NY+92NBAA |
| VG18A5PZ                                                                                               | 6            | 350 / 180 |                  | VG18A5PZ+92NAGA | VG18A5PZ+92NGGA    | VG18A5PZ+92NBGA | VG18A5PZ+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 |
| VG18A5KS                                                                                               |              | 74 / 47   |                  | VG18A5KS+94NAGA | VG18A5KS+94NGGA    | VG18A5KS+94NBGA | VG18A5KS+94NBAA |
| VG18A5GT                                                                                               |              |           |                  | VG18A5GT+94NAGA | VG18A5GT+94NGGA    | VG18A5GT+94NBGA | VG18A5GT+94NBAA |
| VG18A5KT                                                                                               |              |           |                  | VG18A5KT+94NAGA | VG18A5KT+94NGGA    | VG18A5KT+94NBGA | VG18A5KT+94NBAA |
| VG18A5GU                                                                                               |              | 117 / 74  |                  | VG18A5GU+94NAGA | VG18A5GU+94NGGA    | VG18A5GU+94NBGA | VG18A5GU+94NBAA |
| VG18A5KU                                                                                               |              |           |                  | VG18A5KU+94NAGA | VG18A5KU+94NGGA    | VG18A5KU+94NBGA | VG18A5KU+94NBAA |
| VG18A5HT                                                                                               | 3            | 74 / 47   | 50               | VG18A5HT+94NAGA | VG18A5HT+94NGGA    | VG18A5HT+94NBGA | VG18A5HT+94NBAA |
| VG18A5LT                                                                                               |              | 117 / 74  |                  | VG18A5LT+94NAGA | VG18A5LT+94NGGA    | VG18A5LT+94NBGA | VG18A5LT+94NBAA |
| VG18A5HU                                                                                               |              |           |                  | VG18A5HU+94NAGA | VG18A5HU+94NGGA    | VG18A5HU+94NBGA | VG18A5HU+94NBAA |
| VG18A5LU                                                                                               |              |           |                  | VG18A5LU+94NAGA | VG18A5LU+94NGGA    | VG18A5LU+94NBGA | VG18A5LU+94NBAA |
| VG18A5HV                                                                                               |              | 176 / 88  |                  | VG18A5HV+94NAGA | VG18A5HV+94NGGA    | VG18A5HV+94NBGA | VG18A5HV+94NBAA |
| VG18A5LV                                                                                               |              |           |                  | VG18A5LV+94NAGA | VG18A5LV+94NGGA    | VG18A5LV+94NBGA | VG18A5LV+94NBAA |
| VG18A5HW                                                                                               |              | 211 / 105 |                  | VG18A5HW+94NAGA | VG18A5HW+94NGGA    | VG18A5HW+94NBGA | VG18A5HW+94NBAA |
| VG18A5LW                                                                                               |              |           |                  | VG18A5LW+94NAGA | VG18A5LW+94NGGA    | VG18A5LW+94NBGA | VG18A5LW+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 |
| VG18A5MW                                                                                               |              | 190 / 190 |                  | VG18A5MW+94NAGA | VG18A5MW+94NGGA    | VG18A5MW+94NBGA | VG18A5MW+94NBAA |
| VG18A5NY                                                                                               | 5            | 290 / 190 |                  | VG18A5NY+94NAGA | VG18A5NY+94NGGA    | VG18A5NY+94NBGA | VG18A5NY+94NBAA |
| VG18A5PZ                                                                                               | 6            | 350 / 180 |                  | VG18A5PZ+94NAGA | VG18A5PZ+94NGGA    | VG18A5PZ+94NBGA | VG18A5PZ+94NBAA |

## VG1000 Series Flanged Ball Valves (Continued)

### Flanged Stainless Steel Trim Ball Valves with Spring Return Electric Actuators with Two Switches (Part 1 of 2)

| Valve                                                                                  | Size,<br>in. | Cv  | Closeoff<br>PSIG | AC 24 V         |                    |                 | AC 120 V        |
|----------------------------------------------------------------------------------------|--------------|-----|------------------|-----------------|--------------------|-----------------|-----------------|
|                                                                                        |              |     |                  | Floating        | DC 0 to 10 V Prop. | 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 |
| VG12A5KS                                                                               |              | 74  |                  | VG12A5KS+92NAGC | VG12A5KS+92NGGC    | VG12A5KS+92NBGC | VG12A5KS+92NBAC |
| VG12A5GT                                                                               |              |     |                  | VG12A5GT+92NAGC | VG12A5GT+92NGGC    | VG12A5GT+92NBGC | VG12A5GT+92NBAC |
| VG12A5KT                                                                               |              |     |                  | VG12A5KT+92NAGC | VG12A5KT+92NGGC    | VG12A5KT+92NBGC | VG12A5KT+92NBAC |
| VG12A5GU                                                                               |              | 117 |                  | VG12A5GU+92NAGC | VG12A5GU+92NGGC    | VG12A5GU+92NBGC | VG12A5GU+92NBAC |
| VG12A5KU                                                                               |              |     |                  | VG12A5KU+92NAGC | VG12A5KU+92NGGC    | VG12A5KU+92NBGC | VG12A5KU+92NBAC |
| VG12A5HT                                                                               | 3            | 74  | 100              | VG12A5HT+92NAGC | VG12A5HT+92NGGC    | VG12A5HT+92NBGC | VG12A5HT+92NBAC |
| VG12A5LT                                                                               |              | 117 |                  | VG12A5LT+92NAGC | VG12A5LT+92NGGC    | VG12A5LT+92NBGC | VG12A5LT+92NBAC |
| VG12A5HU                                                                               |              |     |                  | VG12A5HU+92NAGC | VG12A5HU+92NGGC    | VG12A5HU+92NBGC | VG12A5HU+92NBAC |
| VG12A5LU                                                                               |              |     |                  | VG12A5LU+92NAGC | VG12A5LU+92NGGC    | VG12A5LU+92NBGC | VG12A5LU+92NBAC |
| VG12A5HV                                                                               |              | 176 |                  | VG12A5HV+92NAGC | VG12A5HV+92NGGC    | VG12A5HV+92NBGC | VG12A5HV+92NBAC |
| VG12A5LV                                                                               |              |     |                  | VG12A5LV+92NAGC | VG12A5LV+92NGGC    | VG12A5LV+92NBGC | VG12A5LV+92NBAC |
| VG12A5HW                                                                               |              | 211 |                  | VG12A5HW+92NAGC | VG12A5HW+92NGGC    | VG12A5HW+92NBGC | VG12A5HW+92NBAC |
| VG12A5LW                                                                               |              |     |                  | VG12A5LW+92NAGC | VG12A5LW+92NGGC    | VG12A5LW+92NBGC | VG12A5LW+92NBAC |
| VG12A5JU                                                                               | 4            | 117 | 100              | VG12A5JU+92NAGC | VG12A5JU+92NGGC    | VG12A5JU+92NBGC | VG12A5JU+92NBAC |
| VG12A5JV                                                                               |              | 176 |                  | VG12A5JV+92NAGC | VG12A5JV+92NGGC    | VG12A5JV+92NBGC | VG12A5JV+92NBAC |
| VG12A5MW                                                                               |              | 190 |                  | VG12A5MW+92NAGC | VG12A5MW+92NGGC    | VG12A5MW+92NBGC | VG12A5MW+92NBAC |
| VG12A5NY                                                                               | 5            | 290 |                  | VG12A5NY+92NAGC | VG12A5NY+92NGGC    | VG12A5NY+92NBGC | VG12A5NY+92NBAC |
| VG12A5PZ                                                                               | 6            | 350 |                  | VG12A5PZ+92NAGC | VG12A5PZ+92NGGC    | VG12A5PZ+92NBGC | VG12A5PZ+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 |
| VG12A5KS                                                                               |              | 74  |                  | VG12A5KS+94NAGC | VG12A5KS+94NGGC    | VG12A5KS+94NBGC | VG12A5KS+94NBAC |
| VG12A5GT                                                                               |              |     |                  | VG12A5GT+94NAGC | VG12A5GT+94NGGC    | VG12A5GT+94NBGC | VG12A5GT+94NBAC |
| VG12A5KT                                                                               |              |     |                  | VG12A5KT+94NAGC | VG12A5KT+94NGGC    | VG12A5KT+94NBGC | VG12A5KT+94NBAC |
| VG12A5GU                                                                               |              | 117 |                  | VG12A5GU+94NAGC | VG12A5GU+94NGGC    | VG12A5GU+94NBGC | VG12A5GU+94NBAC |
| VG12A5KU                                                                               |              |     |                  | VG12A5KU+94NAGC | VG12A5KU+94NGGC    | VG12A5KU+94NBGC | VG12A5KU+94NBAC |
| VG12A5HT                                                                               | 3            | 74  | 100              | VG12A5HT+94NAGC | VG12A5HT+94NGGC    | VG12A5HT+94NBGC | VG12A5HT+94NBAC |
| VG12A5LT                                                                               |              | 117 |                  | VG12A5LT+94NAGC | VG12A5LT+94NGGC    | VG12A5LT+94NBGC | VG12A5LT+94NBAC |
| VG12A5HU                                                                               |              |     |                  | VG12A5HU+94NAGC | VG12A5HU+94NGGC    | VG12A5HU+94NBGC | VG12A5HU+94NBAC |
| VG12A5LU                                                                               |              |     |                  | VG12A5LU+94NAGC | VG12A5LU+94NGGC    | VG12A5LU+94NBGC | VG12A5LU+94NBAC |
| VG12A5HV                                                                               |              | 176 |                  | VG12A5HV+94NAGC | VG12A5HV+94NGGC    | VG12A5HV+94NBGC | VG12A5HV+94NBAC |
| VG12A5LV                                                                               |              |     |                  | VG12A5LV+94NAGC | VG12A5LV+94NGGC    | VG12A5LV+94NBGC | VG18A5LV+94NBAC |
| VG12A5HW                                                                               |              | 211 |                  | VG12A5HW+94NAGC | VG12A5HW+94NGGC    | VG12A5HW+94NBGC | VG12A5HW+94NBAC |
| VG12A5LW                                                                               |              |     |                  | VG12A5LW+94NAGC | VG12A5LW+94NGGC    | VG12A5LW+94NBGC | VG12A5LW+94NBAC |
| VG12A5JU                                                                               | 4            | 117 | 100              | VG12A5JU+94NAGC | VG12A5JU+94NGGC    | VG12A5JU+94NBGC | VG12A5JU+94NBAC |
| VG12A5JV                                                                               |              | 176 |                  | VG12A5JV+94NAGC | VG12A5JV+94NGGC    | VG12A5JV+94NBGC | VG12A5JV+94NBAC |
| VG12A5MW                                                                               |              | 190 |                  | VG12A5MW+94NAGC | VG12A5MW+94NGGC    | VG12A5MW+94NBGC | VG12A5MW+94NBAC |
| VG12A5NY                                                                               | 5            | 290 |                  | VG12A5NY+94NAGC | VG12A5NY+94NGGC    | VG12A5NY+94NBGC | VG12A5NY+94NBAC |
| VG12A5PZ                                                                               | 6            | 350 |                  | VG12A5PZ+94NAGC | VG12A5PZ+94NGGC    | VG12A5PZ+94NBGC | VG12A5PZ+94NBAC |

## VG1000 Series Flanged Ball Valves (Continued)

### Flanged Stainless Steel Trim Ball Valves with Spring Return Electric Actuators with Two Switches (Part 2 of 2)

| Valve                                                                                                             | Size,<br>in. | Cv        | Closeoff<br>PSIG | AC 24 V         |                    |                 | AC 120 V        |
|-------------------------------------------------------------------------------------------------------------------|--------------|-----------|------------------|-----------------|--------------------|-----------------|-----------------|
|                                                                                                                   |              |           |                  | Floating        | DC 0 to 10 V Prop. | On/Off          | On/Off          |
|                                                                                                                   |              |           |                  | M9220-AGC-3     | M9220-GGC-3        | M9220-BGC-3     | M9220-BAC-3     |
| 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 |
| VG18A5KS                                                                                                          |              |           |                  | VG18A5KS+92NAGC | VG18A5KS+92NGGC    | VG18A5KS+92NBGC | VG18A5KS+92NBAC |
| VG18A5GT                                                                                                          |              | 74 / 47   |                  | VG18A5GT+92NAGC | VG18A5GT+92NGGC    | VG18A5GT+92NBGC | VG18A5GT+92NBAC |
| VG18A5KT                                                                                                          |              |           |                  | VG18A5KT+92NAGC | VG18A5KT+92NGGC    | VG18A5KT+92NBGC | VG18A5KT+92NBAC |
| VG18A5GU                                                                                                          |              | 117 / 74  |                  | VG18A5GU+92NAGC | VG18A5GU+92NGGC    | VG18A5GU+92NBGC | VG18A5GU+92NBAC |
| VG18A5KU                                                                                                          |              |           |                  | VG18A5KU+92NAGC | VG18A5KU+92NGGC    | VG18A5KU+92NBGC | VG18A5KU+92NBAC |
| VG18A5HT                                                                                                          | 3            | 74 / 47   | 50               | VG18A5HT+92NAGC | VG18A5HT+92NGGC    | VG18A5HT+92NBGC | VG18A5HT+92NBAC |
| VG18A5LT                                                                                                          |              |           |                  | VG18A5LT+92NAGC | VG18A5LT+92NGGC    | VG18A5LT+92NBGC | VG18A5LT+92NBAC |
| VG18A5HU                                                                                                          |              | 117 / 74  |                  | VG18A5HU+92NAGC | VG18A5HU+92NGGC    | VG18A5HU+92NBGC | VG18A5HU+92NBAC |
| VG18A5LU                                                                                                          |              |           |                  | VG18A5LU+92NAGC | VG18A5LU+92NGGC    | VG18A5LU+92NBGC | VG18A5LU+92NBAC |
| VG18A5HV                                                                                                          |              | 176 / 88  |                  | VG18A5HV+92NAGC | VG18A5HV+92NGGC    | VG18A5HV+92NBGC | VG18A5HV+92NBAC |
| VG18A5LV                                                                                                          |              |           |                  | VG18A5LV+92NAGC | VG18A5LV+92NGGC    | VG18A5LV+92NBGC | VG18A5LV+92NBAC |
| VG18A5HW                                                                                                          |              | 211 / 105 |                  | VG18A5HW+92NAGC | VG18A5HW+92NGGC    | VG18A5HW+92NBGC | VG18A5HW+92NBAC |
| VG18A5LW                                                                                                          |              |           |                  | VG18A5LW+92NAGC | VG18A5LW+92NGGC    | VG18A5LW+92NBGC | VG18A5LW+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 |
| VG18A5MW                                                                                                          |              | 190 / 190 |                  | VG18A5MW+92NAGC | VG18A5MW+92NGGC    | VG18A5MW+92NBGC | VG18A5MW+92NBAC |
| VG18A5NY                                                                                                          | 5            | 290 / 190 |                  | VG18A5NY+92NAGC | VG18A5NY+92NGGC    | VG18A5NY+92NBGC | VG18A5NY+92NBAC |
| VG18A5PZ                                                                                                          | 6            | 350 / 180 |                  | VG18A5PZ+92NAGC | VG18A5PZ+92NGGC    | VG18A5PZ+92NBGC | VG18A5PZ+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 |
| VG18A5KS                                                                                                          |              |           |                  | VG18A5KS+94NAGC | VG18A5KS+94NGGC    | VG18A5KS+94NBGC | VG18A5KS+94NBAC |
| VG18A5GT                                                                                                          |              | 74 / 47   |                  | VG18A5GT+94NAGC | VG18A5GT+94NGGC    | VG18A5GT+94NBGC | VG18A5GT+94NBAC |
| VG18A5KT                                                                                                          |              |           |                  | VG18A5KT+94NAGC | VG18A5KT+94NGGC    | VG18A5KT+94NBGC | VG18A5KT+94NBAC |
| VG18A5GU                                                                                                          |              | 117 / 74  |                  | VG18A5GU+94NAGC | VG18A5GU+94NGGC    | VG18A5GU+94NBGC | VG18A5GU+94NBAC |
| VG18A5KU                                                                                                          |              |           |                  | VG18A5KU+94NAGC | VG18A5KU+94NGGC    | VG18A5KU+94NBGC | VG18A5KU+94NBAC |
| VG18A5HT                                                                                                          | 3            | 74 / 47   | 50               | VG18A5HT+94NAGC | VG18A5HT+94NGGC    | VG18A5HT+94NBGC | VG18A5HT+94NBAC |
| VG18A5LT                                                                                                          |              |           |                  | VG18A5LT+94NAGC | VG18A5LT+94NGGC    | VG18A5LT+94NBGC | VG18A5LT+94NBAC |
| VG18A5HU                                                                                                          |              | 117 / 74  |                  | VG18A5HU+94NAGC | VG18A5HU+94NGGC    | VG18A5HU+94NBGC | VG18A5HU+94NBAC |
| VG18A5LU                                                                                                          |              |           |                  | VG18A5LU+94NAGC | VG18A5LU+94NGGC    | VG18A5LU+94NBGC | VG18A5LU+94NBAC |
| VG18A5HV                                                                                                          |              | 176 / 88  |                  | VG18A5HV+94NAGC | VG18A5HV+94NGGC    | VG18A5HV+94NBGC | VG18A5HV+94NBAC |
| VG18A5LV                                                                                                          |              |           |                  | VG18A5LV+94NAGC | VG18A5LV+94NGGC    | VG18A5LV+94NBGC | VG18A5LV+94NBAC |
| VG18A5HW                                                                                                          |              | 211 / 105 |                  | VG18A5HW+94NAGC | VG18A5HW+94NGGC    | VG18A5HW+94NBGC | VG18A5HW+94NBAC |
| VG18A5LW                                                                                                          |              |           |                  | VG18A5LW+94NAGC | VG18A5LW+94NGGC    | VG18A5LW+94NBGC | VG18A5LW+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 |
| VG18A5MW                                                                                                          |              | 190 / 190 |                  | VG18A5MW+94NAGC | VG18A5MW+94NGGC    | VG18A5MW+94NBGC | VG18A5MW+94NBAC |
| VG18A5NY                                                                                                          | 5            | 290 / 190 |                  | VG18A5NY+94NAGC | VG18A5NY+94NGGC    | VG18A5NY+94NBGC | VG18A5NY+94NBAC |
| VG18A5PZ                                                                                                          | 6            | 350 / 180 |                  | VG18A5PZ+94NAGC | VG18A5PZ+94NGGC    | VG18A5PZ+94NBGC | VG18A5PZ+94NBAC |

## VG1000 Series Flanged Ball Valves (Continued)

### Technical Specifications

| VG1000 Series Flanged Ball Valves                  |                   |                                                                                                                                                                                 |
|----------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service <sup>1</sup>                               |                   | Hot water, chilled water, 50/50 Glycol solutions, and 25 psig (172 kPa) saturated steam for HVAC systems                                                                        |
| Valve Fluid Temperature Limits                     |                   | 0°F to 284°F (-18°C to 140°C)                                                                                                                                                   |
| Valve Body Pressure/Temperature Rating             | Water             | ASME Class 150<br>250 psi at -20°F to 100°F (29°C to 38°C)<br>235 psi at 200°F (93°C)<br>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                                                                   |
| Rangeability <sup>2</sup>                          |                   | Greater than 500:1                                                                                                                                                              |
| Minimum Ambient Operating Temperature              | -4°F (-20°C)      | VA9320 Series Non-Spring Return Actuators                                                                                                                                       |
|                                                    | -40°F (-40°C)     | M9220 Series Spring Return Actuators                                                                                                                                            |
| Maximum Ambient Operating Temperature <sup>3</sup> | 122°F (50°C)      | VA9320 Series Non-Spring Return Actuators                                                                                                                                       |
|                                                    | 131°F (55°C)      | M9220 Series Spring Return Actuators                                                                                                                                            |
| 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                                                                                                                                                           |
| 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                                                                                                                                          |
| Compliance                                         | Europe            | CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the Pressure Equipment Directive (PED). |

1. Refer to the VDI 2035 Guideline 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.



**WARNING** This product is made of copper alloy, which contains lead. The product is therefore not to be used on drinking water.



**WARNING** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### WARNING: BRASS MAY CONTAIN LEAD

To fulfill our obligations towards Article 33, in accordance to the European REACH Regulation No 1907/2006 EC, we hereby inform you that this article contains the following Substances of Very High Concern mentioned on the Candidate list:

- Lead

## VG1000 Series Flanged Ball Valves for Assembly in the Field

### Description

The VG1000 Series Flanged Ball Valves are primarily designed to regulate the flow of hot water, chilled water, and 50/50 glycol solutions to the demand of a controller in HVAC systems. The valves come in sizes of 2-1/2 in., 3 in., 4 in., 5 in., and 6 in. 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.

Refer to the *VG1000 Series Flanged Ball Valve Product Bulletin (LIT-12011228)* for important product application information and single point of contact information.

### 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°F to 284°F [-18°C 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 VA9320 or M9220 Series Electric Actuators—reduces field installation time and cost.

### VG1000 Series Ball Valves Shown with Field Mounted M9000 Series Actuators



- M9000-340 and M9000-343 Weather Shields Available for Field Installation—protect the actuator from corrosion, rain, freezing rain, sleet, and snow.

### Repair Information

If the VG1000 Series Ball Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls® representative.

### WARNING

This product is made of copper alloy, which contains lead. The product is therefore not to be used on drinking water.

### Selection Charts

#### Flanged Ball Valves (for Assembly in the Field)

| Part Number |           | Size, in. (DN) | Closeoff psig |           | Control Disk | Control Port A | Control Port B |
|-------------|-----------|----------------|---------------|-----------|--------------|----------------|----------------|
| Two-Way     | Three-Way |                | Two-Way       | Three-Way |              | Cv (Kv)        | Cv (Kv)        |
| VG12A5GS    | VG18A5GS  | 2-1/2 (DN65)   | 100           | 50        | Yes          | 47 (40)        | 29 (25)        |
| VG12A5KS    | VG18A5KS  |                |               |           |              | 74 (63)        | 47 (40)        |
| VG12A5GT    | VG18A5GT  |                |               |           |              | 117 (100)      | 74 (63)        |
| VG12A5KT    | VG18A5KT  |                |               |           |              | 74 (63)        | 47 (40)        |
| VG12A5GU    | VG18A5GU  |                |               |           |              | 117 (100)      | 74 (63)        |
| VG12A5KU    | VG18A5KU  |                |               |           |              | 176 (150)      | 88 (75)        |
| VG12A5HT    | VG18A5HT  | 3 (DN80)       | 100           | 50        | Yes          | 74 (63)        | 47 (40)        |
| VG12A5LT    | VG18A5LT  |                |               |           |              | 117 (100)      | 74 (63)        |
| VG12A5HU    | VG18A5HU  |                |               |           |              | 176 (150)      | 88 (75)        |
| VG12A5LU    | VG18A5LU  |                |               |           |              | 211 (180)      | 105 (90)       |
| VG12A5HV    | VG18A5HV  |                |               |           |              | 117 (100)      | 74 (63)        |
| VG12A5LV    | VG18A5LV  |                |               |           |              | 176 (150)      | 88 (75)        |
| VG12A5HW    | VG18A5HW  | 4 (DN100)      | 100           | 50        | No           | 211 (180)      | 105 (90)       |
| VG12A5LW    | VG18A5LW  |                |               |           | Yes          | 117 (100)      | 74 (63)        |
| VG12A5JU    | VG18A5JU  |                |               |           |              | 176 (150)      | 88 (75)        |
| VG12A5JW    | VG18A5JW  | 4 (DN100)      | 100           | 50        | No           | 190 (164)      | 190 (164)      |
| VG12A5MW    | VG18A5MW  | 5 (DN125)      | 100           | 50        | Yes          | 290 (251)      | 190 (164)      |
| VG12A5NY    | VG18A5NY  | 6 (DN150)      | 100           | 50        | Yes          | 350 (302)      | 180 (156)      |
| VG12A5PZ    | VG18A5PZ  |                |               |           | No           |                |                |

### WARNING: BRASS MAY CONTAIN LEAD

To fulfill our obligations towards Article 33, in accordance to the European REACH Regulation No 1907/2006 EC, we hereby inform you that this article contains the following Substances of Very High Concern mentioned on the Candidate list:

- Lead

## VG1000 Series Flanged Ball Valves for Assembly in the Field (Continued)

### Actuators and Linkages (for Assembly in the Field)

| Spring Return | Control Type |          |                          |                                        | Supply Voltage | SPDT Aux. Switches | Actuator Code | Switch Kit Code | Linkage Code | Optional Weather Shield |
|---------------|--------------|----------|--------------------------|----------------------------------------|----------------|--------------------|---------------|-----------------|--------------|-------------------------|
|               | on/off       | floating | proportional 0(2)...10 V | proportional 0(4)...20 mA <sup>1</sup> |                |                    |               |                 |              |                         |
| Yes           |              | X        |                          |                                        | 24 VAC/VDC     | 0                  | M9220-AGA-3   | -               | M9000-519    | M9000-340               |
|               |              | X        |                          |                                        |                | 2                  | M9220-AGC-3   |                 |              |                         |
|               | X            |          |                          |                                        | 120 VAC        | 0                  | M9220-BAA-3   |                 |              |                         |
|               | X            |          |                          |                                        |                | 2                  | M9220-BAC-3   |                 |              |                         |
|               | X            |          |                          |                                        | 24 VAC/VDC     | 0                  | M9220-BGA-3   |                 |              |                         |
|               | X            |          |                          |                                        |                | 2                  | M9220-BGC-3   |                 |              |                         |
|               |              |          | X                        | X                                      | 24 VAC/VDC     | 0                  | M9220-GGA-3   |                 |              |                         |
|               |              |          | X                        | X                                      |                | 2                  | M9220-GGC-3   |                 |              |                         |
| No            | X            | X        | X                        | X                                      | 100...240 VDC  | 0                  | M9320-AUA-2   | -               | -            | M9000-343               |
|               | X            | X        | X                        | X                                      |                | 2                  | M9320-AUA-2   | M9300-2         |              |                         |
|               | X            | X        | X                        | X                                      | 24 VAC/VDC     | 0                  | M9320-HGA-2   | -               |              |                         |
|               | X            | X        | X                        | X                                      |                | 2                  | M9320-HGA-2   | M9300-2         |              |                         |

<sup>1</sup> with field furnished 500 ohm resistor

### Technical Specifications

| VG1000 Series Flanged Ball Valves for Assembly in the Field |                   |                                                                                                                                                                                 |
|-------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service <sup>1</sup>                                        |                   | Hot water, chilled water, 50/50 Glycol solutions, and 25 psig (172 kPa) saturated steam for HVAC systems                                                                        |
| Valve Fluid Temperature Limits                              |                   | 0°F to 284°F (-18°C to 140°C)                                                                                                                                                   |
| Valve Body Pressure/Temperature Rating                      | Water             | ASME Class 150<br>250 psi at -20°F to 100°F (29°C to 38°C)<br>235 psi at 200°F (93°C)<br>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)                                                                                                                                                                |
| Flow Characteristics                                        | Two-Way           | Equal percentage                                                                                                                                                                |
|                                                             | Three-Way         | Equal percentage flow characteristics of in-line port or<br>Linear percentage flow characteristics of angle port                                                                |
| Rangeability <sup>2</sup>                                   |                   | Greater than 500:1                                                                                                                                                              |
| Minimum Ambient Operating Temperature                       | -4°F (-20°C)      | M9320 Series Non-Spring Return Actuators                                                                                                                                        |
|                                                             | -40°F (-40°C)     | M9220 Series Spring Return Actuators                                                                                                                                            |
| Maximum Ambient Operating Temperature <sup>3</sup>          | 122°F (50°C)      | M9320 Series Non-Spring Return Actuators                                                                                                                                        |
|                                                             | 131°F (55°C)      | M9220 Series Spring Return Actuators                                                                                                                                            |
| 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                                                                                                                                                           |
| 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                                                                                                                                                                    |
| Compliance                                                  | Flow Control Disk | Amodel AS-1145HS Polyphthalamide resin                                                                                                                                          |
|                                                             | Europe            | CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the Pressure Equipment Directive (PED). |

1. Refer to the VDI 2035 Guideline 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.



This product can expose you to chemicals including lead, which is known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## VG2000 Series Electric Cast Iron Flanged Globe Valves

### Description

VG2000 Series Electric Cast Iron Flanged Globe Valves are designed primarily to regulate the flow of water and steam in response to the demand of a controller in HVAC systems. Available in sizes 2-1/2 in. through 6 in., these ANSI Class 125 valves are available in Normally Open (N.O.), Normally Closed (N.C.), and three-way mixing configurations. Both electric and pneumatic actuators are available for factory or field mounting.

Refer to the *VG2000 Series Cast Iron Flanged Globe Valves Product Bulletin (LIT-977133)* for important product application information.

### Repair Information

If the VG2000 Series Globe Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls® representative.

### Features

- Complete Family of 2-1/2 in. through 6 in. Cast Iron Flanged Globe Valves, Brass Trim, with Several Styles of Electric and Pneumatic Actuators — offers a broad selection from which to choose.
- Flexible Features and Options Ordering Matrix — allow engineering to suit your specific application from thousands of easy-to-select, factory-assembled combinations.
- Standard Johnson Controls Ring Pack Packings — provide industry-leading reliability and operating life.
- Every Valve Tested for Leakage — provides energy conservation and ensures occupant comfort.



VG2000 Series Electric Cast Iron Flanged Globe Valves

### Selection Charts

#### VG2000 Series Valves with M91xx-xGx-2 Actuators — Non-Spring Return

| Valve Code Number           | Size, in. | Cv  | Closeoff psig | On/Off Floating without Switches | Proportional without Switches | On/Off Floating with Two Switches | Proportional with Two Switches |
|-----------------------------|-----------|-----|---------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|
|                             |           |     |               | M9116-AGA-2<br>M9124-AGA-2       | M9116-GGA-2<br>M9124-GGA-2    | M9116-AGC-2<br>M9124-AGC-2        | M9116-GGC-2<br>M9124-GGC-2     |
| Two-Way, Push-Down-to-Close |           |     |               |                                  |                               |                                   |                                |
| VG2231TM                    | 2-1/2     | 51  | 62            | VG2231TM+916AGA                  | VG2231TM+916GGA               | VG2231TM+916AGC                   | VG2231TM+916GGC                |
|                             | 2-1/2     | 51  | 101           | VG2231TM+924AGA                  | VG2231TM+924GGA               | VG2231TM+924AGC                   | VG2231TM+924GGC                |
| VG2231UM                    | 3         | 83  | 27            | VG2231UM+916AGA                  | VG2231UM+916GGA               | VG2231UM+916AGC                   | VG2231UM+916GGC                |
|                             | 3         | 83  | 43            | VG2231UM+924AGA                  | VG2231UM+924GGA               | VG2231UM+924AGC                   | VG2231UM+924GGC                |
|                             | 3         | 83  | 88            | VG2231UM2924AGA <sup>1</sup>     | VG2231UM2924GGA <sup>1</sup>  | VG2231UM2924AGC <sup>1</sup>      | VG2231UM2924GGC <sup>1</sup>   |
| VG2231VM                    | 4         | 150 | 24            | VG2231VM+924AGA                  | VG2231VM+924GGA               | VG2231VM+924AGC                   | VG2231VM+924GGC                |
|                             | 4         | 150 | 49            | VG2231VM2924AGA <sup>1</sup>     | VG2231VM2924GGA <sup>1</sup>  | VG2231VM2924AGC <sup>1</sup>      | VG2231VM2924GGC <sup>1</sup>   |
| VG2231WN                    | 5         | 240 | 26            | VG2231WN2924AGA <sup>1</sup>     | VG2231WN2924GGA <sup>1</sup>  | VG2231WN2924AGC <sup>1</sup>      | VG2231WN2924GGC <sup>1</sup>   |
| VG2231YN                    | 6         | 350 | 16            | VG2231YN2924AGA <sup>1</sup>     | VG2231YN2924GGA <sup>1</sup>  | VG2231YN2924AGC <sup>1</sup>      | VG2231YN2924GGC <sup>1</sup>   |
| Three-Way, Mixing           |           |     |               |                                  |                               |                                   |                                |
| VG2831TM                    | 2-1/2     | 54  | 37            | VG2831TM+916AGA                  | VG2831TM+916GGA               | VG2831TM+916AGC                   | VG2831TM+916GGC                |
|                             | 2-1/2     | 54  | 60            | VG2831TM+924AGA                  | VG2831TM+924GGA               | VG2831TM+924AGC                   | VG2831TM+924GGC                |
| VG2831UM                    | 3         | 80  | 16            | VG2831UM+916AGA                  | VG2831UM+916GGA               | VG2831UM+916AGC                   | VG2831UM+916GGC                |
|                             | 3         | 80  | 26            | VG2831UM+924AGA                  | VG2831UM+924GGA               | VG2831UM+924AGC                   | VG2831UM+924GGC                |
|                             | 3         | 80  | 53            | VG2831UM2924AGA <sup>1</sup>     | VG2831UM2924GGA <sup>1</sup>  | VG2831UM2924AGC <sup>1</sup>      | VG2831UM2924GGC <sup>1</sup>   |
| VG2831VM                    | 4         | 157 | 9             | VG2831VM+916AGA                  | VG2831VM+916GGA               | VG2831VM+916AGC                   | VG2831VM+916GGC                |
|                             | 4         | 157 | 14            | VG2831VM+924AGA                  | VG2831VM+924GGA               | VG2831VM+924AGC                   | VG2831VM+924GGC                |
|                             | 4         | 157 | 30            | VG2831VM2924AGA <sup>1</sup>     | VG2831VM2924GGA <sup>1</sup>  | VG2831VM2924AGC <sup>1</sup>      | VG2831VM2924GGC <sup>1</sup>   |
| VG2831WN                    | 5         | 238 | 7             | VG2831WN+924AGA                  | VG2831WN+924GGA               | VG2831WN+924AGC                   | VG2831WN+924GGC                |
|                             | 5         | 238 | 15            | VG2831WN2924AGA <sup>1</sup>     | VG2831WN2924GGA <sup>1</sup>  | VG2831WN2924AGC <sup>1</sup>      | VG2831WN2924GGC <sup>1</sup>   |
| VG2831YN                    | 6         | 347 | 4             | VG2831YN+924AGA                  | VG2831YN+924GGA               | VG2831YN+924AGC                   | VG2831YN+924GGC                |
|                             | 6         | 347 | 9             | VG2831YN2924AGA <sup>1</sup>     | VG2831YN2924GGA <sup>1</sup>  | VG2831YN2924AGC <sup>1</sup>      | VG2831YN2924GGC <sup>1</sup>   |

1. Valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches. M9116-AGx-2 actuators are not designed for tandem operation.

## VG2000 Series Electric Cast Iron Flanged Globe Valves (Continued)



VG2000 Series Valves with M9220 Series Non-Spring-Return Electric Valve Actuators

### VG2000 Series Valves with M9220-xGx-3 Actuators — Spring Return — Floating and On/Off

| Valve Code Number                                                         | Size, in. | Cv  | Closeoff psig | Floating                     |                              | On/Off                       |                              |
|---------------------------------------------------------------------------|-----------|-----|---------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                                                                           |           |     |               | Without Switches             | With Two Switches            | Without Switches             | With Two Switches            |
|                                                                           |           |     |               | M9220-AGA-3                  | M9220-AGC-3                  | M9220-BGA-3                  | M9220-BGC-3                  |
| Two-Way — Spring Return Normally Open — Valve Stem Up                     |           |     |               |                              |                              |                              |                              |
| VG2231TM                                                                  | 2-1/2     | 51  | 76            | VG2231TM+92NAGA              | VG2231TM+92NAGC              | VG2231TM+92NBGA              | VG2231TM+92NBGC              |
| VG2231UM                                                                  | 3         | 83  | 33            | VG2231UM+92NAGA              | VG2231UM+92NAGC              | VG2231UM+92NBGA              | VG2231UM+92NBGC              |
|                                                                           | 3         | 83  | 66            | VG2231UM292NAGA <sup>1</sup> | VG2231UM292NAGC <sup>1</sup> | VG2231UM292NBGA <sup>1</sup> | VG2231UM292NBGC <sup>1</sup> |
| VG2231VM                                                                  | 4         | 150 | 37            | VG2231VM292NAGA <sup>1</sup> | VG2231VM292NAGC <sup>1</sup> | VG2231VM292NBGA <sup>1</sup> | VG2231VM292NBGC <sup>1</sup> |
| VG2231WM                                                                  | 5         | 240 | 20            | VG2231WM292NAGA <sup>1</sup> | VG2231WM292NAGC <sup>1</sup> | VG2231WM292NBGA <sup>1</sup> | VG2231WM292NBGC <sup>1</sup> |
| Two-Way — Spring Return Normally Closed — Valve Stem Down                 |           |     |               |                              |                              |                              |                              |
| VG2231TM                                                                  | 2-1/2     | 51  | 76            | VG2231TM+94NAGA              | VG2231TM+94NAGC              | VG2231TM+94NBGA              | VG2231TM+94NBGC              |
| VG2231UM                                                                  | 3         | 83  | 33            | VG2231UM+94NAGA              | VG2231UM+94NAGC              | VG2231UM+94NBGA              | VG2231UM+94NBGC              |
|                                                                           | 3         | 83  | 66            | VG2231UM294NAGA <sup>1</sup> | VG2231UM294NAGC <sup>1</sup> | VG2231UM294NBGA <sup>1</sup> | VG2231UM294NBGC <sup>1</sup> |
| VG2231VM                                                                  | 4         | 150 | 37            | VG2231VM294NAGA <sup>1</sup> | VG2231VM294NAGC <sup>1</sup> | VG2231VM294NBGA <sup>1</sup> | VG2231VM294NBGC <sup>1</sup> |
| VG2231WM                                                                  | 5         | 240 | 20            | VG2231WM294NAGA <sup>1</sup> | VG2231WM294NAGC <sup>1</sup> | VG2231WM294NBGA <sup>1</sup> | VG2231WM294NBGC <sup>1</sup> |
| Three-Way Mixing — Spring Return — Valve Stem Up — Side Inlet Port Closed |           |     |               |                              |                              |                              |                              |
| VG2831TM                                                                  | 2-1/2     | 54  | 45            | VG2831TM+92NAGA              | VG2831TM+92NAGC              | VG2831TM+92NBGA              | VG2831TM+92NBGC              |
| VG2831UM                                                                  | 3         | 80  | 20            | VG2831UM+92NAGA              | VG2831UM+92NAGC              | VG2831UM+92NBGA              | VG2831UM+92NBGC              |
|                                                                           | 3         | 80  | 40            | VG2831UM292NAGA <sup>1</sup> | VG2831UM292NAGC <sup>1</sup> | VG2831UM292NBGA <sup>1</sup> | VG2831UM292NBGC <sup>1</sup> |
| VG2831VM                                                                  | 4         | 157 | 11            | VG2831VM+92NAGA              | VG2831VM+92NAGC              | VG2831VM+92NBGA              | VG2831VM+92NBGC              |
|                                                                           | 4         | 157 | 22            | VG2831VM292NAGA <sup>1</sup> | VG2831VM292NAGC <sup>1</sup> | VG2831VM292NBGA <sup>1</sup> | VG2831VM292NBGC <sup>1</sup> |
| VG2831WN                                                                  | 5         | 238 | 12            | VG2831WN292NAGA <sup>1</sup> | VG2831WN292NAGC <sup>1</sup> | VG2831WN292NBGA <sup>1</sup> | VG2831WN292NBGC <sup>1</sup> |
| VG2831YN                                                                  | 6         | 347 | 7             | VG2831YN292NAGA <sup>1</sup> | VG2831YN292NAGC <sup>1</sup> | VG2831YN292NBGA <sup>1</sup> | VG2831YN292NBGC <sup>1</sup> |
| Three-Way Mixing — Spring Return — Valve Stem Down — Side Inlet Port Open |           |     |               |                              |                              |                              |                              |
| VG2831TM                                                                  | 2-1/2     | 54  | 45            | VG2831TM+94NAGA              | VG2831TM+94NAGC              | VG2831TM+94NBGA              | VG2831TM+94NBGC              |
| VG2831UM                                                                  | 3         | 80  | 20            | VG2831UM+94NAGA              | VG2831UM+94NAGC              | VG2831UM+94NBGA              | VG2831UM+94NBGC              |
|                                                                           | 3         | 80  | 40            | VG2831UM294NAGA <sup>1</sup> | VG2831UM294NAGC <sup>1</sup> | VG2831UM294NBGA <sup>1</sup> | VG2831UM294NBGC <sup>1</sup> |
| VG2831VM                                                                  | 4         | 157 | 11            | VG2831VM+94NAGA              | VG2831VM+94NAGC              | VG2831VM+94NBGA              | VG2831VM+94NBGC              |
|                                                                           | 4         | 157 | 22            | VG2831VM294NAGA <sup>1</sup> | VG2831VM294NAGC <sup>1</sup> | VG2831VM294NBGA <sup>1</sup> | VG2831VM294NBGC <sup>1</sup> |
| VG2831WN                                                                  | 5         | 238 | 12            | VG2831WN294NAGA <sup>1</sup> | VG2831WN294NAGC <sup>1</sup> | VG2831WN294NBGA <sup>1</sup> | VG2831WN294NBGC <sup>1</sup> |
| VG2831YN                                                                  | 6         | 347 | 7             | VG2831YN294NAGA <sup>1</sup> | VG2831YN294NAGC <sup>1</sup> | VG2831YN294NBGA <sup>1</sup> | VG2831YN294NBGC <sup>1</sup> |

1. Valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches.

## VG2000 Series Electric Cast Iron Flanged Globe Valves (Continued)

### VG2000 Series Valves with M9220-xGx-3 Actuators — Proportional

| Valve Code Number                                                         | Size, in. | Cv  | Closeoff psig | Without Switches             | With Two Switches            |
|---------------------------------------------------------------------------|-----------|-----|---------------|------------------------------|------------------------------|
|                                                                           |           |     |               | M9220-GGA-3                  | M9220-GGC-3                  |
| Two-Way — Spring Return Normally Open — Valve Stem Up                     |           |     |               |                              |                              |
| VG2231TM                                                                  | 2-1/2     | 51  | 76            | VG2231TM+92NGGA              | VG2231TM+92NGGC              |
| VG2231UM                                                                  | 3         | 83  | 33            | VG2231UM+92NGGA              | VG2231UM+92NGGC              |
|                                                                           | 3         | 83  | 66            | VG2231UM292NGGA <sup>1</sup> | VG2231UM292NGGC <sup>1</sup> |
| VG2231VM                                                                  | 4         | 150 | 37            | VG2231VM292NGGA <sup>1</sup> | VG2231VM292NGGC <sup>1</sup> |
| VG2231WM                                                                  | 5         | 240 | 20            | VG2231WM292NGGA <sup>1</sup> | VG2231WM292NGGC <sup>1</sup> |
| Two-Way — Spring Return Normally Closed — Valve Stem Down                 |           |     |               |                              |                              |
| VG2231TM                                                                  | 2-1/2     | 51  | 76            | VG2231TM+94NGGA              | VG2231TM+94NGGC              |
| VG2231UM                                                                  | 3         | 83  | 33            | VG2231UM+94NGGA              | VG2231UM+94NGGC              |
|                                                                           | 3         | 83  | 66            | VG2231UM294NGGA <sup>1</sup> | VG2231UM294NGGC <sup>1</sup> |
| VG2231VM                                                                  | 4         | 150 | 37            | VG2231VM294NGGA <sup>1</sup> | VG2231VM294NGGC <sup>1</sup> |
| VG2231WM                                                                  | 5         | 240 | 20            | VG2231WM294NGGA <sup>1</sup> | VG2231WM294NGGC <sup>1</sup> |
| Three-Way Mixing — Spring Return — Valve Stem Up — Side Inlet Port Closed |           |     |               |                              |                              |
| VG2831TM                                                                  | 2-1/2     | 54  | 45            | VG2831TM+92NGGA              | VG2831TM+92NGGC              |
| VG2831UM                                                                  | 3         | 80  | 20            | VG2831UM+92NGGA              | VG2831UM+92NGGC              |
|                                                                           | 3         | 80  | 40            | VG2831UM292NGGA <sup>1</sup> | VG2831UM292NGGC <sup>1</sup> |
| VG2831VM                                                                  | 4         | 157 | 11            | VG2831VM+92NGGA              | VG2831VM+92NGGC              |
|                                                                           | 4         | 157 | 22            | VG2831VM292NGGA <sup>1</sup> | VG2831VM292NGGC <sup>1</sup> |
| VG2831WN                                                                  | 5         | 238 | 12            | VG2831WN292NGGA <sup>1</sup> | VG2831WN292NGGC <sup>1</sup> |
| VG2831YN                                                                  | 6         | 347 | 7             | VG2831YN292NGGA <sup>1</sup> | VG2831YN292NGGC <sup>1</sup> |
| Three-Way Mixing — Spring Return — Valve Stem Down — Side Inlet Port Open |           |     |               |                              |                              |
| VG2831TM                                                                  | 2-1/2     | 54  | 45            | VG2831TM+94NGGA              | VG2831TM+94NGGC              |
| VG2831UM                                                                  | 3         | 80  | 20            | VG2831UM+94NGGA              | VG2831UM+94NGGC              |
|                                                                           | 3         | 80  | 40            | VG2831UM294NGGA <sup>1</sup> | VG2831UM294NGGC <sup>1</sup> |
| VG2831VM                                                                  | 4         | 157 | 11            | VG2831VM+94NGGA              | VG2831VM+94NGGC              |
|                                                                           | 4         | 157 | 22            | VG2831VM294NGGA <sup>1</sup> | VG2831VM294NGGC <sup>1</sup> |
| VG2831WN                                                                  | 5         | 238 | 12            | VG2831WN294NGGA <sup>1</sup> | VG2831WN294NGGC <sup>1</sup> |
| VG2831YN                                                                  | 6         | 347 | 7             | VG2831YN294NGGA <sup>1</sup> | VG2831YN294NGGC <sup>1</sup> |

1. Valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches.

## VG2000 Series Electric Cast Iron Flanged Globe Valves (Continued)



**VG2000 Series Valves with VA-3100 Series Non-Spring-Return Electric Valve Actuators**



**VG2000 Series Valves with VA-6100 Series Non-Spring-Return Electric Valve Actuators**



### VG2000 Series Valves with VA-3100-xGx Series Non-Spring-Return Actuators

| Valve Code Number           | Size, in. | Cv  | Closeoff psig | Floating without Switches | Floating with Feedback and Two Switches | 0 to 10 VDC Proportional with Two Switches |
|-----------------------------|-----------|-----|---------------|---------------------------|-----------------------------------------|--------------------------------------------|
|                             |           |     |               | VA-3100-AGA               | VA-3100-AGC                             | VA-3100-HGC                                |
| Two-Way, Push-Down-to-Close |           |     |               |                           |                                         |                                            |
| VG2231TM                    | 2-1/2     | 51  | 115           | VG2231TM+300AGA           | VG2231TM+300AGC                         | VG2231TM+300HGC                            |
| VG2231UM                    | 3         | 83  | 79            | VG2231UM+301AGA           | VG2231UM+301AGC                         | VG2231UM+301HGC                            |
| VG2231VM                    | 4         | 150 | 45            | VG2231VM+301AGA           | VG2231VM+301AGC                         | VG2231VM+301HGC                            |
| VG2231WN                    | 5         | 240 | 29            | VG2231WN+302AGA           | VG2231WN+302AGC                         | VG2231WN+302HGC                            |
| VG2231YN                    | 6         | 350 | 20            | VG2231YN+302AGA           | VG2231YN+302AGC                         | VG2231YN+302HGC                            |
| Three-Way Mixing            |           |     |               |                           |                                         |                                            |
| VG2831TM                    | 2-1/2     | 54  | 69            | VG2831TM+300AGA           | VG2831TM+300AGC                         | VG2831TM+300HGC                            |
| VG2831UM                    | 3         | 80  | 48            | VG2831UM+301AGA           | VG2831UM+301AGC                         | VG2831UM+301HGC                            |
| VG2831VM                    | 4         | 157 | 27            | VG2831VM+301AGA           | VG2831VM+301AGC                         | VG2831VM+301HGC                            |
| VG2831WN                    | 5         | 238 | 17            | VG2831WN+302AGA           | VG2831WN+302AGC                         | VG2831WN+302HGC                            |
| VG2831YN                    | 6         | 347 | 12            | VG2831YN+302AGA           | VG2831YN+302AGC                         | VG2831YN+302HGC                            |

### VG2000 Series Valves with VA-6100-xGx Series Non-Spring-Return Actuators

| Valve Code Number          | Size, in. | Cv  | Closeoff psig | Floating with Two Switches | 0 to 10 VDC Proportional with Two Switches |
|----------------------------|-----------|-----|---------------|----------------------------|--------------------------------------------|
|                            |           |     |               | VA-6100-AGC                | VA-6100-HGC                                |
| Two-Way Push-Down-to-Close |           |     |               |                            |                                            |
| VG2231VM                   | 4         | 150 | 89            | VG2231VM+602AGC            | VG2231VM+602HGC                            |
| VG2231WN                   | 5         | 240 | 57            | VG2231WN+602AGC            | VG2231WN+602HGC                            |
| VG2231YN                   | 6         | 350 | 40            | VG2231YN+602AGC            | VG2231YN+602HGC                            |
| Three-Way Mixing           |           |     |               |                            |                                            |
| VG2831VM                   | 4         | 157 | 54            | VG2831VM+602AGC            | VG2831VM+602HGC                            |
| VG2831WN                   | 5         | 238 | 34            | VG2831WN+602AGC            | VG2831WN+602HGC                            |
| VG2831YN                   | 6         | 347 | 24            | VG2831YN+602AGC            | VG2831YN+602HGC                            |

## VG2000 Series Electric Cast Iron Flanged Globe Valves (Continued)

### Technical Specifications

| VG2000 Series Electric Cast Iron Flanged Globe Valves                        |                               |                                                                                                                      |
|------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Service<sup>1</sup></b>                                                   |                               | Hot Water, Chilled Water, 50% Glycol Solutions, and Steam for HVAC Systems                                           |
| <b>Valve Stroke</b>                                                          | <b>2-1/2 and 3 in. Valves</b> | 3/4 in. (19 mm)                                                                                                      |
|                                                                              | <b>3 and 4 in. Valves</b>     | 1-1/8 in. (29 mm)                                                                                                    |
|                                                                              | <b>5 in. Valves</b>           | 1-3/8 in. (35 mm)                                                                                                    |
|                                                                              | <b>6 in. Valves</b>           | 1-1/2 in. (38 mm)                                                                                                    |
| <b>Valve Body Rating</b>                                                     |                               | Meets Requirements of ASME B16.1, Class 125                                                                          |
| <b>Valve Assembly Maximum Allowable Pressure/Temperature</b>                 | <b>Steam</b>                  | 35 psig (241 kPa) at 281°F (138°C)                                                                                   |
|                                                                              | <b>Water</b>                  | 175 psig (1,206 kPa) up to 150°F (66°C),<br>Decreasing to 125 psig (861 kPa) at 281°F (138°C)                        |
| <b>Leakage</b>                                                               |                               | 0.1% of Maximum Flow                                                                                                 |
| <b>Inherent Flow Characteristics</b>                                         |                               | Modified Linear                                                                                                      |
| <b>Rangeability<sup>2</sup></b>                                              | <b>2-1/2 in. Valves</b>       | 6.5:1                                                                                                                |
|                                                                              | <b>3 in. Valves</b>           | 7.7:1                                                                                                                |
|                                                                              | <b>4 in. Valves</b>           | 9.3:1                                                                                                                |
|                                                                              | <b>5 in. Valves</b>           | 10.7:1                                                                                                               |
|                                                                              | <b>6 in. Valves</b>           | 10.4:1                                                                                                               |
| <b>Spring Ranges (MP8000 Series Actuators)</b>                               |                               | 3 psig to 7 psig, 4 psig to 8 psig, and 9 psig to 13 psig (21 kPa to 48 kPa, 28 kPa to 55 kPa, and 62 kPa to 90 kPa) |
| <b>Maximum Recommended Operating Pressure Drop</b>                           |                               | 35 psig (241 kPa) for All Valve Sizes                                                                                |
| <b>Maximum Actuator Supply Pressure (Pneumatically Actuated Valves Only)</b> |                               | 25 psig (172 kPa) Maximum                                                                                            |
| <b>Materials</b>                                                             | <b>Body</b>                   | Cast Iron with Black Lacquer Finish                                                                                  |
|                                                                              | <b>Stem</b>                   | 316 Stainless Steel                                                                                                  |
|                                                                              | <b>Plug</b>                   | Brass                                                                                                                |
|                                                                              | <b>Packing</b>                | Ethylene Propylene Terpolymer (EPT) Ring Packs                                                                       |
| <b>Valve Fluid Operating Temperature Limits</b>                              |                               | 35°F to 281°F (2°C to 138°C), 35 psig (241 kPa) Saturated Steam                                                      |
| <b>Actuator Ambient Operating Temperature Limits</b>                         |                               | Refer to the Appropriate Actuator Product Bulletin.                                                                  |
| <b>Compliance</b>                                                            | <b>Canada</b>                 | CRN: 0C1100.9087YTN                                                                                                  |

1. Proper water treatment is recommended; refer to the VDI 2035 Guideline.

2. Rangeability is defined as the ratio of maximum flow to minimum controllable flow.

## VG2000 Series Pneumatic Cast Iron Flanged Globe Valves



**MP8000 Series Actuators**  
Mounted on VG2231 Two-Way Normally Open Valves



**MP8000 Series Actuators**  
Mounted on VG2431 Two-Way Normally Closed Valves

### Description

#### VG2000 Series Valve

VG2000 Series Cast Iron Flanged Globe Valves are designed primarily to regulate the flow of water and steam in response to the demand of a controller.

Refer to the *VG2000 Series Cast Iron Flanged Globe Valve Product Bulletin (LIT-977133)* for important product application information.

#### MP8000 Series Actuators

MP8000 Series Pneumatic Actuators are designed to accurately position hot-water, chilled-water, and steam-control valves in response to a pneumatic signal from a controller.

Refer to the *MP8000 Series Pneumatic Valve Actuators Product Bulletin (LIT-977257)* for important product application information.

### Features

#### VG2000 Series Valve

- controls hot or chilled water, 35 psig saturated steam
- ANSI cast iron 125 flange meets ANSI B16.1
- ANSI III closeoff, leakage: 0.1% of maximum flow
- 175 psig static pressure rating at water temperatures 35°F to 150°F; decreasing to 125 psig at 281°F
- maximum recommended operating pressure drop: 35 psig
- maximum actuator supply pressure: 25 psig

#### MP8000 Series Actuators

- three sizes: 25 sq. in., 50 sq. in., and 100 sq. in. effective diaphragm area
- spring action field reversible
- optional pneumatic or electro-pneumatic positioner

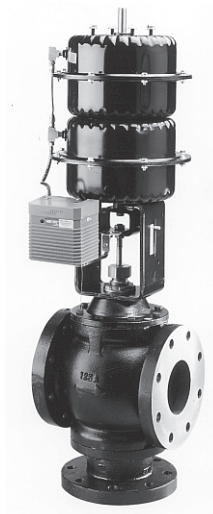
### Repair Information

If the VG2000 Series Globe Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls® representative.

For complete details about VG2000 Series Cast Iron Flanged Valve repair parts, refer to the *VG2000 Series Cast Iron Flanged Valve Product Bulletin (LIT-977133)*. For complete details about MP8000 Series Pneumatic Actuator repair parts, refer to the *MP8000 Series Pneumatic Actuator Product Bulletin (LIT-977257)*.



**MP8000 Series Actuators**  
Mounted on VG2831 Three-Way Mixing Valves



## VG2000 Series Pneumatic Cast Iron Flanged Globe Valves (Continued)

### Selection Charts

#### Two-Way Normally Open Pneumatic Cast Iron Flanged Globe Valves

| Spring Range                                                      |           |     | 3 psig to 7 psig |                 | 4 psig to 8 psig |                 | 9 psig to 13 psig |                 |
|-------------------------------------------------------------------|-----------|-----|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Valve Code Number                                                 | Size, in. | Cv  | Closeoff psig    | Code Number     | Closeoff psig    | Code Number     | Closeoff psig     | Code Number     |
| With MP82 Series Actuators — 25 sq. in. Effective Diaphragm Area  |           |     |                  |                 |                  |                 |                   |                 |
| VG2231TL                                                          | 2-1/2     | 51  | 53               | VG2231TL+823C00 | 49               | VG2231TL+823D00 | 28                | VG2231TL+823E00 |
| VG2231UL                                                          | 3         | 83  | 37               | VG2231UL+823C00 | 34               | VG2231UL+823D00 | 19                | VG2231UL+823E00 |
| With MP84 Series Actuators — 50 sq. in. Effective Diaphragm Area  |           |     |                  |                 |                  |                 |                   |                 |
| VG2231TM                                                          | 2-1/2     | 51  | 109              | VG2231TM+843C00 | 100              | VG2231TM+843D00 | 58                | VG2231TM+843E00 |
| VG2231UM                                                          | 3         | 83  | 75               | VG2231UM+845C00 | 70               | VG2231UM+845D00 | 40                | VG2231UM+845E00 |
| VG2231VM                                                          | 4         | 150 | 42               | VG2231VM+845C00 | 39               | VG2231VM+845D00 | 23                | VG2231VM+845E00 |
| With MP86 Series Actuators — 100 sq. in. Effective Diaphragm Area |           |     |                  |                 |                  |                 |                   |                 |
| VG2231UN                                                          | 3         | 83  | 152              | VG2231UN+865C00 | 140              | VG2231UN+865D00 | 81                | VG2231UN+865E00 |
| VG2231VN                                                          | 4         | 150 | 86               | VG2231VN+865C00 | 79               | VG2231VN+865D00 | 46                | VG2231VN+865E00 |
| VG2231WN                                                          | 5         | 240 | 55               | VG2231WN+867C00 | 51               | VG2231WN+867D00 | 29                | VG2231WN+867E00 |
| VG2231YN                                                          | 6         | 350 | 38               | VG2231YN+867C00 | 35               | VG2231YN+867D00 | 20                | VG2231YN+867E00 |

#### Two-Way Normally Closed Pneumatic Cast Iron Flanged Globe Valves

| Spring Range                                                      |           |     | 3 psig to 7 psig |                 | 4 psig to 8 psig |                 | 9 psig to 13 psig |                 |
|-------------------------------------------------------------------|-----------|-----|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Valve Code Number                                                 | Size, in. | Cv  | Closeoff psig    | Code Number     | Closeoff psig    | Code Number     | Closeoff psig     | Code Number     |
| With MP84 Series Actuators — 50 sq. in. Effective Diaphragm Area  |           |     |                  |                 |                  |                 |                   |                 |
| VG2431TM                                                          | 2-1/2     | 54  | 24               | VG2431TM+843C00 | 32               | VG2431TM+843D00 | 75                | VG2431TM+843E00 |
| VG2431UM                                                          | 3         | 83  | 17               | VG2431UM+845C00 | 22               | VG2431UM+845D00 | 52                | VG2431UM+845E00 |
| VG2431VM                                                          | 4         | 150 | 9                | VG2431VM+845C00 | 13               | VG2431VM+845D00 | 29                | VG2431VM+845E00 |
| With MP86 Series Actuators — 100 sq. in. Effective Diaphragm Area |           |     |                  |                 |                  |                 |                   |                 |
| VG2431UN                                                          | 3         | 83  | 34               | VG2431UN+865C00 | 46               | VG2431UN+865D00 | 105               | VG2431UN+865E00 |
| VG2431VN                                                          | 4         | 150 | 19               | VG2431VN+865C00 | 26               | VG2431VN+865D00 | 59                | VG2431VN+865E00 |
| VG2431WN                                                          | 5         | 237 | 12               | VG2431WN+867C00 | 17               | VG2431WN+867D00 | 38                | VG2431WN+867E00 |
| VG2431YN                                                          | 6         | 344 | 9                | VG2431YN+867C00 | 11               | VG2431YN+867D00 | 26                | VG2431YN+867E00 |

#### Three-Way Mixing Pneumatic Cast Iron Flanged Globe Valves

| Spring Range                                                      |           |     | 3 psig to 7 psig |                 | 4 psig to 8 psig |                 | 9 psig to 13 psig |                 |
|-------------------------------------------------------------------|-----------|-----|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Valve Code Number                                                 | Size, in. | Cv  | Closeoff psig    | Code Number     | Closeoff psig    | Code Number     | Closeoff psig     | Code Number     |
| With MP84 Series Actuators — 50 sq. in. Effective Diaphragm Area  |           |     |                  |                 |                  |                 |                   |                 |
| VG2831TM                                                          | 2-1/2     | 54  | 65/14            | VG2831TM+843C00 | 60/19            | VG2831TM+843D00 | 35/45             | VG2831TM+843E00 |
| VG2831UM                                                          | 3         | 80  | 45/10            | VG2831UM+845C00 | 42/13            | VG2831UM+845D00 | 24/31             | VG2831UM+845E00 |
| VG2831VM                                                          | 4         | 157 | 25/6             | VG2831VM+845C00 | 23/8             | VG2831VM+845D00 | 14/18             | VG2831VM+845E00 |
| With MP86 Series Actuators — 100 sq. in. Effective Diaphragm Area |           |     |                  |                 |                  |                 |                   |                 |
| VG2831UN                                                          | 3         | 80  | 91/21            | VG2831UN+865C00 | 84/28            | VG2831UN+865D00 | 49/63             | VG2831UN+865E00 |
| VG2831VN                                                          | 4         | 157 | 51/12            | VG2831VN+865C00 | 47/16            | VG2831VN+865D00 | 27/35             | VG2831VN+865E00 |
| VG2831WN                                                          | 5         | 238 | 33/7             | VG2831WN+867C00 | 30/10            | VG2831WN+867D00 | 18/23             | VG2831WN+867E00 |
| VG2831YN                                                          | 6         | 347 | 23/5             | VG2831YN+867C00 | 21/7             | VG2831YN+867D00 | 12/16             | VG2831YN+867E00 |

#### Optional Positioner — Change the 00 at the end of the code number to either 01 or 02

| Optional Positioner | Mounting Bracket | Type              | Control Input                                  | Output Capacity                                                         | Ordering Code |
|---------------------|------------------|-------------------|------------------------------------------------|-------------------------------------------------------------------------|---------------|
| V-9502-95           | MP8000-6002      | Pneumatic         | 2 to 12 psig Start<br>3 to 13 psig Span        | 1,000 scim — Dual Barbed Fitting<br>1,600 scim — 1/4 in. Barbed Fitting | 01            |
| EPP-1000-8          | MP8000-6003      | Electro-Pneumatic | 0 to 10 VDC<br>4 to 20 mA<br>135 Ohm Slidewire | 476 scim                                                                | 02            |

## VG2000 Series Pneumatic Cast Iron Flanged Globe Valves (Continued)

### Technical Specifications

| VG2000 Series Pneumatic Cast Iron Flanged Globe Valves |                         |                                                                                           |
|--------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------|
| <b>Service<sup>1</sup></b>                             |                         | Hot Water, Chilled Water, 50/50 Glycol Solutions, and Steam for HVAC Systems              |
| <b>Fluid Temperature Limits</b>                        | <b>Water</b>            | 35°F to 281°F (2°C to 138°C)                                                              |
|                                                        | <b>Steam</b>            | 35 psig (241 kPa) Saturated Steam                                                         |
| <b>Maximum Allowable Pressure/Temperature</b>          | <b>Water</b>            | 175 psig (1,206 kPa) up to 150°F (66°C) Decreasing to 125 psig (861 kPa) at 281°F (138°C) |
|                                                        | <b>Steam</b>            | 35 psig (241 kPa) Saturated Steam at 281°F (138°C)                                        |
| <b>Valve Body Pressure/Temperature Rating</b>          |                         | Meets Requirements of ANSI B16.15, Class 125                                              |
| <b>Maximum Recommended Operating Pressure Drop</b>     |                         | 35 psig (241 kPa)                                                                         |
| <b>Flow Characteristics</b>                            |                         | Modified Linear                                                                           |
| <b>Rangeability<sup>2</sup></b>                        | <b>2-1/2 in. Valves</b> | 6.5:1                                                                                     |
|                                                        | <b>3 in. Valves</b>     | 7.7:1                                                                                     |
|                                                        | <b>4 in. Valves</b>     | 9.3:1                                                                                     |
|                                                        | <b>5 in. Valves</b>     | 10.7:1                                                                                    |
|                                                        | <b>6 in. Valves</b>     | 10.4:1                                                                                    |
| <b>Leakage</b>                                         |                         | 0.1% of Maximum Flow per ANSI/FCI 70-2, Class 3                                           |
| <b>Actuator Ambient Operating Temperature Limits</b>   |                         | -20°F to 150°F (-29°C to 66°C)                                                            |
| <b>Maximum Actuator Supply Pressure</b>                |                         | 25 psig (172 kPa) Maximum                                                                 |
| <b>Materials</b>                                       | <b>Body</b>             | Cast Iron with Black Lacquer Finish                                                       |
|                                                        | <b>Stem</b>             | Stainless Steel                                                                           |
|                                                        | <b>Plug</b>             | Brass                                                                                     |
|                                                        | <b>Packing</b>          | Ethylene Propylene Terpolymer (EPT) Rink Packs                                            |
| <b>Compliance</b>                                      | <b>Canada</b>           | CRN: 0C1100.9087YTN                                                                       |

1. Refer to the VDI 2035 Guideline for recommended proper water treatment.

2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.



**WARNING** This product is made of copper alloy, which contains lead. The product is therefore not to be used on drinking water.



**WARNING** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### WARNING: BRASS MAY CONTAIN LEAD

To fulfill our obligations towards Article 33, in accordance to the European REACH Regulation No 1907/2006 EC, we hereby inform you that this article contains the following Substances of Very High Concern mentioned on the Candidate list:

- Lead

# VG2000 Series Cast Iron Flanged Globe Valves for Assembly in the Field

## Description

VG2000 Series Cast Iron Flanged Globe Valves are designed primarily to regulate the flow of water and steam in response to the demand of a controller in HVAC systems. Available in sizes 2-1/2 in. through 6 in., these ANSI Class 125 valves are available in Normally Open (N.O.), Normally Closed (N.C.), and three-way mixing configurations. Both electric and pneumatic actuators are available for factory or field mounting.

Refer to the *VG2000 Series Cast Iron Flanged Globe Valves Product Bulletin (LIT-977133)* for important product application information.

## Repair Information

If the VG2000 Series Globe Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls® representative.

## Features

- Complete Family of 2-1/2 in. through 6 in. Cast Iron Flanged Globe Valves, Brass Trim, with Several Styles of Electric and Pneumatic Actuators — offers a broad selection from which to choose.
- Flexible Features and Options Ordering Matrix — allow engineering to suit your specific application from thousands of easy-to-select, factory-assembled combinations.
- Standard Johnson Controls Ring Pack Packings — provide industry-leading reliability and operating life.
- Every Valve Tested for Leakage — provides energy conservation and ensures occupant comfort.



**MP84 Actuated VG2000 Series Valve**

## Selection Charts

### VG2000 Series Flanged Globe Valve Bodies/MP8000 Series Pneumatic Spring-Return Actuators

| Spring Range                                    |                 |     | 3 psig to 7 psig |                      | 4 psig to 8 psig |                      | 9 psig to 13 psig |                      |
|-------------------------------------------------|-----------------|-----|------------------|----------------------|------------------|----------------------|-------------------|----------------------|
| Valve Body Code Number                          | Valve Size, in. | Cv  | Closeoff psig    | Actuator Code Number | Closeoff psig    | Actuator Code Number | Closeoff psig     | Actuator Code Number |
| <b>Two-Way Normally Open with MP82 Series</b>   |                 |     |                  |                      |                  |                      |                   |                      |
| VG2231TL                                        | 2-1/2           | 51  | 53               | MP823C001E           | 49               | MP823D001E           | 28                | MP823E001E           |
| VG2231UL                                        | 3               | 83  | 37               | MP823C001E           | 34               | MP823D001E           | 19                | MP823E001E           |
| <b>Two-Way Normally Open with MP84 Series</b>   |                 |     |                  |                      |                  |                      |                   |                      |
| VG2231TM                                        | 2-1/2           | 51  | 109              | MP843C001F           | 100              | MP843D001F           | 58                | MP843E001F           |
| VG2231UM                                        | 3               | 83  | 75               | MP845C001F           | 70               | MP845D001F           | 40                | MP845E001F           |
| VG2231VM                                        | 4               | 150 | 42               | MP845C001F           | 39               | MP845D001F           | 23                | MP845E001F           |
| <b>Two-Way Normally Open with MP86 Series</b>   |                 |     |                  |                      |                  |                      |                   |                      |
| VG2231UN                                        | 3               | 83  | 152              | MP865C001G           | 140              | MP865D001G           | 81                | MP865E001G           |
| VG2231VN                                        | 4               | 150 | 86               | MP865C001G           | 79               | MP865D001G           | 46                | MP865E001G           |
| VG2231WN                                        | 5               | 240 | 55               | MP867C001G           | 51               | MP867D001G           | 29                | MP867E001G           |
| VG2231YN                                        | 6               | 350 | 38               | MP867C001G           | 35               | MP867D001G           | 20                | MP867E001G           |
| <b>Two-Way Normally Closed with MP84 Series</b> |                 |     |                  |                      |                  |                      |                   |                      |
| VG2431TM                                        | 2-1/2           | 54  | 24               | MP843C001F           | 32               | MP843D001F           | 75                | MP843E001F           |
| VG2431UM                                        | 3               | 83  | 17               | MP845C001F           | 22               | MP845D001F           | 52                | MP845E001F           |
| VG2431VM                                        | 4               | 150 | 9                | MP845C001F           | 13               | MP845D001F           | 29                | MP845E001F           |
| <b>Two-Way Normally Closed with MP86 Series</b> |                 |     |                  |                      |                  |                      |                   |                      |
| VG2431UN                                        | 3               | 83  | 34               | MP865C001G           | 46               | MP865D001G           | 105               | MP865E001G           |
| VG2431VN                                        | 4               | 150 | 19               | MP865C001G           | 26               | MP865D001G           | 59                | MP865E001G           |
| VG2431WN                                        | 5               | 237 | 12               | MP867C001G           | 17               | MP867D001G           | 38                | MP867E001G           |
| VG2431YN                                        | 6               | 344 | 9                | MP867C001G           | 11               | MP867D001G           | 26                | MP867E001G           |
| <b>Three-Way Mixing with MP84 Series</b>        |                 |     |                  |                      |                  |                      |                   |                      |
| VG2831TM                                        | 2-1/2           | 54  | 65/14            | MP843C001F           | 60/19            | MP843D001F           | 35/45             | MP843E001F           |
| VG2831UM                                        | 3               | 80  | 45/10            | MP845C001F           | 42/13            | MP845D001F           | 24/31             | MP845E001F           |
| VG2831VM                                        | 4               | 157 | 25/6             | MP845C001F           | 23/8             | MP845D001F           | 14/18             | MP845E001F           |
| <b>Three-Way Mixing with MP86 Series</b>        |                 |     |                  |                      |                  |                      |                   |                      |
| VG2831UN                                        | 3               | 80  | 91/21            | MP865C001G           | 84/28            | MP865D001G           | 49/63             | MP865E001G           |
| VG2831VN                                        | 4               | 157 | 51/12            | MP865C001G           | 47/16            | MP865D001G           | 27/35             | MP865E001G           |
| VG2831WN                                        | 5               | 238 | 33/7             | MP867C001G           | 23/8             | MP867D001G           | 18/23             | MP867E001G           |
| VG2831YN                                        | 6               | 347 | 23/5             | MP867C001G           | 21/7             | MP867D001G           | 12/16             | MP867E001G           |

## VG2000 Series Cast Iron Flanged Globe Valves for Assembly in the Field (Continued)

### Mounting Kits for Field Mounting MP8000 Series Pneumatic Actuators

| Mounting Kit Code Number | Actuator Style      | Valve Size, in. | Stem Type (Diameter)                 |
|--------------------------|---------------------|-----------------|--------------------------------------|
| MP8000-6201              | MP82/MP83/MP84/MP85 | 2-1/2 through 4 | L Stem (3/8 in.) or M Stem (3/8 in.) |
| MP8000-6203              | MP86/MP87           | 3 through 6     | N Stem (1/2 in.)                     |

### Positioners and Positioner Mounting Kits for MP8000 Series Pneumatic Valve Actuators

| Code Number | Description                                                                                                                   | Shipping Weight, lb (kg) |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| V-9502-95   | Pneumatic Valve Actuator Positioner (Less Spring and Mounting Hardware)                                                       | 0.9 (0.41)               |
| MP8000-6002 | Mounting Kit for V-9502-95 Pneumatic Valve Actuator Positioner (Kit Includes All Necessary Mounting Hardware and Six Springs) | 1.3 (0.59)               |
| EPP-1000-8  | Electro-Pneumatic Valve Actuator Positioner (Less Mounting Hardware)                                                          | 1.6 (0.73)               |
| MP8000-6003 | Mounting Kit for EPP-1000-8 Electro-Pneumatic Valve Actuator Positioner (Kit Includes All Necessary Mounting Hardware)        | 1.5 (0.68)               |



M9100 Non-Spring-Return Actuated VG2000 Series Valves



M9220 Spring-Return Actuated VG2000 Series Valves

### VG2000 Flanged Globe Valve Bodies/M9100 Series Electric Non-Spring-Return Actuators

| Valve Body Code Number     | Valve Size, in. | Cv  | Closeoff psig | Mounting Kit Code Number | Non-Spring-Return Actuator Code Numbers |                          |                              |                          |
|----------------------------|-----------------|-----|---------------|--------------------------|-----------------------------------------|--------------------------|------------------------------|--------------------------|
|                            |                 |     |               |                          | Floating Control                        |                          | 0 VDC to 10 VDC Proportional |                          |
|                            |                 |     |               |                          | Without Switches                        | With Two Switches        | Without Switches             | With Two Switches        |
| Two-Way Push-Down-to-Close |                 |     |               |                          |                                         |                          |                              |                          |
| VG2231TM                   | 2-1/2           | 51  | 62            | M9000-530                | M9116-AGA-2                             | M9116-AGC-2              | M9116-GGA-2                  | M9116-GGC-2              |
|                            | 2/1/2           | 51  | 101           |                          | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
| VG2231UM                   | 3               | 83  | 27            | M9000-531                | M9116-AGA-2                             | M9116-AGC-2              | M9116-GGA-2                  | M9116-GGC-2              |
|                            | 3               | 83  | 43            |                          | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
|                            | 3               | 83  | 88            | M9000-532                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| VG2231VM                   | 4               | 150 | 24            | M9000-531                | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
|                            | 4               | 150 | 49            | M9000-532                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| VG2231WN                   | 5               | 240 | 26            | M9000-534                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| VG2231YN                   | 6               | 350 | 16            | M9000-536                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| Three-Way Mixing           |                 |     |               |                          |                                         |                          |                              |                          |
| VG2831TM                   | 2-1/2           | 54  | 37            | M9000-530                | M9116-AGA-2                             | M9116-AGC-2              | M9116-GGA-2                  | M9116-GGC-2              |
|                            | 2-1/2           | 54  | 60            |                          | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
| VG2831UM                   | 3               | 80  | 16            | M9000-531                | M9116-AGA-2                             | M9116-AGC-2              | M9116-GGA-2                  | M9116-GGC-2              |
|                            | 3               | 80  | 26            |                          | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
|                            | 3               | 80  | 53            | M9000-532                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| VG2831VM                   | 4               | 157 | 9             | M9000-531                | M9116-AGA-2                             | M9116-AGC-2              | M9116-GGA-2                  | M9116-GGC-2              |
|                            | 4               | 157 | 14            |                          | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
| VG2831VN                   | 4               | 157 | 30            | M9000-532                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| VG2831WN                   | 5               | 238 | 7             | M9000-533                | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
|                            | 5               | 238 | 15            | M9000-534                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |
| VG2831YN                   | 6               | 347 | 4             | M9000-535                | M9124-AGA-2                             | M9124-AGC-2              | M9124-GGA-2                  | M9124-GGC-2              |
|                            | 6               | 347 | 9             | M9000-536                | M9124-AGA-2 <sup>1</sup>                | M9124-AGC-2 <sup>1</sup> | M9124-GGA-2 <sup>1</sup>     | M9124-GGC-2 <sup>1</sup> |

1. Valve assemblies require two actuators mounted in tandem. On tandem assemblies with switches, only one actuator is required to have switches.

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## VG2000 Series Cast Iron Flanged Globe Valves for Assembly in the Field (Continued)

### Flanged Globe Valve Bodies/M9220 Series Electric Spring-Return Actuators

| Valve Body Code Number                  | Valve Size, in. | Cv  | Closeoff psig | Mounting Kit Code Number | Spring-Return Actuator Code Numbers |                          |                          |                          |                              |                          |
|-----------------------------------------|-----------------|-----|---------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|------------------------------|--------------------------|
|                                         |                 |     |               |                          | Floating Control                    |                          | On/Off Control           |                          | 0 VDC to 10 VDC Proportional |                          |
|                                         |                 |     |               |                          | Without Switches                    | With Two Switches        | Without Switches         | With Two Switches        | Without Switches             | With Two Switches        |
| Two-Way Push-Down-to-Close <sup>1</sup> |                 |     |               |                          |                                     |                          |                          |                          |                              |                          |
| VG2231TM                                | 2-1/2           | 51  | 76            | M9000-530                | M9220-AGA-3                         | M9220-AGC-3              | M9220-BGA-3              | M9220-BGC-3              | M9220-GGA-3                  | M9220-GGC-3              |
| VG2231UM                                | 3               | 83  | 33            | M9000-531                |                                     |                          |                          |                          |                              |                          |
|                                         | 3               | 83  | 66            | M9000-532                |                                     |                          |                          |                          |                              |                          |
| VG2231VM                                | 4               | 150 | 37            |                          |                                     |                          |                          |                          |                              |                          |
| VG2231WN                                | 5               | 240 | 20            | M9000-534                |                                     |                          |                          |                          |                              |                          |
| Three-Way Mixing                        |                 |     |               |                          |                                     |                          |                          |                          |                              |                          |
| VG2831TM                                | 2-1/2           | 54  | 45            | M9000-530                | M9220-AGA-3                         | M9220-AGC-3              | M9220-BGA-3              | M9220-BGC-3              | M9220-GGA-3                  | M9220-GGC-3              |
| VG2831UM                                | 3               | 80  | 20            | M9000-531                |                                     |                          |                          |                          |                              |                          |
|                                         | 3               | 80  | 40            | M9000-532                |                                     |                          |                          |                          |                              |                          |
| VG2831VM                                | 4               | 157 | 11            | M9000-531                |                                     |                          |                          |                          |                              |                          |
| VG2831VN                                | 4               | 157 | 22            | M9000-532                | M9220-AGA-3 <sup>2</sup>            | M9220-AGC-3 <sup>2</sup> | M9220-BGA-3 <sup>2</sup> | M9220-BGC-3 <sup>2</sup> | M9220-GGA-3 <sup>2</sup>     | M9220-GGC-3 <sup>2</sup> |
| VG2831WN                                | 5               | 238 | 12            | M9000-534                |                                     |                          |                          |                          |                              |                          |
| VG2831YN                                | 6               | 347 | 7             | M9000-536                |                                     |                          |                          |                          |                              |                          |

1. Actuator can be configured to spring-return the valve either open or closed.

2. Valve assemblies require two actuators mounted in tandem. On tandem assemblies with switches, only one actuator is required to have switches.

### Mounting Kits for Field Mounting M9100 and M9220 Series Electric Actuators

| Mounting Kit Code Number | Number of Actuators | Valve                 | Valve Size, in. | Valve Stroke, in. | Stem Type (Diameter) |
|--------------------------|---------------------|-----------------------|-----------------|-------------------|----------------------|
| M9000-530                | Single              | VG2x31TM              | 2-1/2           | 3/4               | M Stem (3/8 in.)     |
| M9000-531                |                     | VG2x31UM and VG2x31VM | 3 and 4         | 1-1/8             |                      |
| M9000-532                | Dual                |                       |                 |                   |                      |
| M9000-533                | Single              | VG2x31WN              | 5               | 1-3/8             | N Stem (1/2 in.)     |
| M9000-534                | Dual                |                       |                 |                   |                      |
| M9000-535                | Single              | VG2x31YN              | 6               | 1-1/2             |                      |
| M9000-536                | Dual                |                       |                 |                   |                      |
| M9000-537                |                     | VG2x31UN and VG2x31VN | 3 and 4         | 1-1/8             |                      |

## VG2000 Series Cast Iron Flanged Globe Valves for Assembly in the Field (Continued)



VA-3100 Actuated Two-Way VG2000 Series Valves



VA-6100 Actuated Three-Way VG200 Series Valves

### Flanged Globe Valve Bodies/VA-3100 Series Electric Non-Spring-Return Actuators

| Valve Body Code Number     | Valve Size, in. | Cv  | Closeoff psig | Mounting Kit Code Number | Non-Spring-Return Actuator Code Numbers |                            |                                                |
|----------------------------|-----------------|-----|---------------|--------------------------|-----------------------------------------|----------------------------|------------------------------------------------|
|                            |                 |     |               |                          | Floating without Switches               | Floating with Two Switches | 0 VDC to 10 VDC Proportional with Two Switches |
| Two-Way Push-Down-to-Close |                 |     |               |                          |                                         |                            |                                                |
| VG2231TM                   | 2-1/2           | 51  | 115           | VA-3100-500              | VA-3100-AGA                             | VA-3100-AGC                | VA-3100-HGC                                    |
| VG2231UM                   | 3               | 83  | 79            |                          |                                         |                            |                                                |
| VG2231VM                   | 4               | 150 | 45            |                          |                                         |                            |                                                |
| VG2231WM                   | 5               | 240 | 29            | VA-3100-501              |                                         |                            |                                                |
| VG2231YN                   | 6               | 350 | 20            |                          |                                         |                            |                                                |
| Three-Way Mixing           |                 |     |               |                          |                                         |                            |                                                |
| VG2831TM                   | 2-1/2           | 54  | 69            | VA-3100-500              | VA-3100-AGA                             | VA-3100-AGC                | VA-3100-HGC                                    |
| VG2831UM                   | 3               | 80  | 48            |                          |                                         |                            |                                                |
| VG2831VM                   | 4               | 157 | 27            |                          |                                         |                            |                                                |
| VG2831WM                   | 5               | 238 | 17            | VA-3100-501              |                                         |                            |                                                |
| VG2831YN                   | 6               | 347 | 12            |                          |                                         |                            |                                                |

### Flanged Globe Valve Bodies/VA-6100 Series Electric Non-Spring-Return Actuators

| Valve Body Code Number     | Valve Size, in. | Cv  | Closeoff psig | Mounting Kit Code Number | Non-Spring-Return Actuator Code Numbers |                                                |
|----------------------------|-----------------|-----|---------------|--------------------------|-----------------------------------------|------------------------------------------------|
|                            |                 |     |               |                          | Floating without Switches               | 0 VDC to 10 VDC Proportional with Two Switches |
| Two-Way Push-Down-to-Close |                 |     |               |                          |                                         |                                                |
| VG2231VN                   | 4               | 150 | 89            | VA-3100-501              | VA-6100-AGC                             | VA-6100-HGC                                    |
| VG2231WM                   | 5               | 240 | 57            |                          |                                         |                                                |
| VG2231YN                   | 6               | 350 | 40            |                          |                                         |                                                |
| Three-Way Mixing           |                 |     |               |                          |                                         |                                                |
| VG2831VM                   | 4               | 157 | 54            | VA-3100-501              | VA-6100-AGC                             | VA-6100-HGC                                    |
| VG2831WM                   | 5               | 238 | 34            |                          |                                         |                                                |
| VG2831YN                   | 6               | 347 | 24            |                          |                                         |                                                |

### Mounting Kits for Field Mounting VA-3100 and VA-6100 Series Electric Actuators

| Mounting Kit Code Number | Actuator Series | Valve Size, in. | Stem Type (Diameter) |
|--------------------------|-----------------|-----------------|----------------------|
| VA-3100-500              | VA-3100         | 2-1/2 through 4 | M Stem (3/8 in.)     |
|                          |                 | 5 and 6         | N Stem (1/2 in.)     |
| VA-3100-501              | VA-6100         | 4 through 6     |                      |

### Tool Kit for VA-3100 Series Electric Actuators

| Code Number | Description                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|
| VA-3100-101 | Auxiliary Switch Cam Adjusting Wrench (Used on VA-3100 Series Electric Actuators – One Wrench is Supplied with Each Actuator) |

## VG2000 Series Cast Iron Flanged Globe Valves for Assembly in the Field (Continued)

### Technical Specifications

| VG2000 Series Cast Iron Flanged Globe Valves for Assembly in the Field |                        |                                                                                                                      |
|------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------|
| Service <sup>1</sup>                                                   |                        | Hot Water, Chilled Water, 50% Glycol Solutions, and Steam for HVAC Systems                                           |
| Valve Stroke                                                           | 2-1/2 and 3 in. Valves | 3/4 in. (19 mm)                                                                                                      |
|                                                                        | 3 and 4 in. Valves     | 1-1/8 in. (29 mm)                                                                                                    |
|                                                                        | 5 in. Valves           | 1-3/8 in. (35 mm)                                                                                                    |
|                                                                        | 6 in. Valves           | 1-1/2 in. (38 mm)                                                                                                    |
| Valve Body Rating                                                      |                        | Meets Requirements of ASME B16.1, Class 125                                                                          |
| Valve Assembly Maximum Allowable Pressure/Temperature                  | Steam                  | 35 psig (241 kPa) at 281°F (138°C)                                                                                   |
|                                                                        | Water                  | 175 psig (1,206 kPa) up to 150°F (66°C),<br>Decreasing to 125 psig (861 kPa) at 281°F (138°C)                        |
| Leakage                                                                |                        | 0.1% of Maximum Flow                                                                                                 |
| Inherent Flow Characteristics                                          |                        | Modified Linear                                                                                                      |
| Rangeability <sup>2</sup>                                              | 2-1/2 in. Valves       | 6.5:1                                                                                                                |
|                                                                        | 3 in. Valves           | 7.7:1                                                                                                                |
|                                                                        | 4 in. Valves           | 9.3:1                                                                                                                |
|                                                                        | 5 in. Valves           | 10.7:1                                                                                                               |
|                                                                        | 6 in. Valves           | 10.4:1                                                                                                               |
| Spring Ranges (MP8000 Series Actuators)                                |                        | 3 psig to 7 psig, 4 psig to 8 psig, and 9 psig to 13 psig (21 kPa to 48 kPa, 28 kPa to 55 kPa, and 62 kPa to 90 kPa) |
| Maximum Recommended Operating Pressure Drop                            |                        | 35 psig (241 kPa) for All Valve Sizes                                                                                |
| Maximum Actuator Supply Pressure (Pneumatically Actuated Valves Only)  |                        | 25 psig (172 kPa) Maximum                                                                                            |
| Materials                                                              | Body                   | Cast Iron with Black Lacquer Finish                                                                                  |
|                                                                        | Stem                   | 316 Stainless Steel                                                                                                  |
|                                                                        | Plug                   | Brass                                                                                                                |
|                                                                        | Packing                | Ethylene Propylene Terpolymer (EPT) Ring Packs                                                                       |
| Valve Fluid Operating Temperature Limits                               |                        | 35°F to 281°F (2°C to 138°C),<br>35 psig (241 kPa) Saturated Steam                                                   |
| Actuator Ambient Operating Temperature Limits                          | M91xx Series           | -4°F to 122°F (-20°C to 50°C)                                                                                        |
|                                                                        | M9220 Series           | -40°F to 131°F (-40°C to 55°C)                                                                                       |
|                                                                        | VA-3100 Series         | 14°F to 140°F (-10°C to 60°C) Floating Control<br>14°F to 122°F (-10°C to 50°C) Proportional Control                 |
|                                                                        | VA-6100 Series         | -4°F to 140°F (-20°C to 60°C)                                                                                        |
|                                                                        | MP8000 Series          | -20°F to 150°F (-29°C to 66°C)                                                                                       |
| Compliance                                                             | Canada                 | CRN: 0C1100.9087YTN                                                                                                  |

1. Proper water treatment is recommended; refer to the VDI 2035 Guideline.

2. Rangeability is defined as the ratio of maximum flow to minimum controllable flow.

## VA-3100 Series Electric Valve Actuators

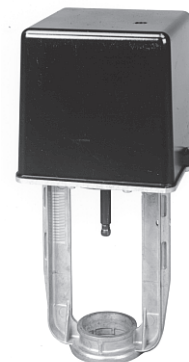
### Description

VA-3100 Series Electric Valve Actuators use a synchronous motor to accurately position Johnson Controls® VG2000 Series Cast Iron Flanged Globe Valves in HVAC and industrial applications. These non-spring-return electric actuators have a 675 lb (3,000 N) force output for on/off (floating) or proportional control. Integral auxiliary switches are available to indicate end-stop position or to perform switching functions. Position feedback is also available through an isolated 2,000 ohm potentiometer. All models feature a manual hand crank for manual positioning of the valve, independent of a power supply.

Refer to the *VA-3100 Series Electric Valve Actuators Product Bulletin (LIT-977283)* for important product application information.

### Features

- synchronous motor with pressure switches
- provides a constant running speed and establishes fixed closeoff forces
- two-bolt coupler clamp provides quick and easy coupling of the actuator to the valve stem
- on/off (floating) or proportional control allows optimal choice of control signal
- adjustable starting point, span, and action (proportional control model only) provides application flexibility and allows for easy sequencing from only one output signal
- 0 to 10 VDC position feedback signal (proportional control model only) provides accurate valve position indication in response to an input signal up to 10 VDC
- auxiliary switches and feedback potentiometer available on select models provide independent verification of actuator position
- manual hand crank allows for manual positioning of the valve, independent of a power supply



**VA-3100 Series  
Electric Valve Actuator**

### Repair Information

If the VA-3100 Series Electric Valve Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls representative.

### Selection Chart

| Description                                      | Actuator Model |             |             |
|--------------------------------------------------|----------------|-------------|-------------|
|                                                  | VA-3100-AGA    | VA-3100-AGC | VA-3100-HGC |
| On/Off (Floating) Control                        | ■              | ■           | —           |
| Proportional Control                             | —              | —           | ■           |
| Feedback:                                        |                |             |             |
| 2,000 Ohm Potentiometer                          | —              | ■           | —           |
| Two Auxiliary Switches                           | —              | ■           | ■           |
| Stem and Valve Size:                             |                |             |             |
| M Stem (3/8 in., 2-1/2 in. through 4 in. Valves) | ■              | ■           | ■           |
| N Stem (1/2 in.), 5 in. and 6 in. Valves         | ■              | ■           | ■           |

### Accessories

| Code Number | Description                                                                                                                                                                                                                                                                                                                                            | Ship.Wt., lb <sup>1</sup> |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| VA-3100-101 | Auxiliary Switch Cam Adjusting Wrench (Used on VA-3100 Series Electric Actuators – One Wrench is Supplied with Each Actuator)                                                                                                                                                                                                                          | 0.1                       |
| VA-3100-500 | Mounting Kit for Field Mounting VA-3100 Series Electric Actuators to 2-1/2 through 4 in. VG2000 Series Cast Iron Flanged Globe Valves with 3/8 in. M Stem (Kit Includes One Stem Jam Nut, One Yoke Adaptor, One Packing Nut, One 2-1/4 in. Length Stem Adaptor for 2-1/2 in. Valves, and One 2-1/2 in. Length Stem Adaptor for 3 in. and 4 in. Valves) | 3.0                       |
| VA-3100-501 | Mounting Kit for Field Mounting VA-3100 Series Electric Actuators to 5 in. and 6 in. VG2000 Series Cast Iron Flanged Globe Valves with 1/2 in. N Stem (Kit Includes One Stem Jam Nut, One Yoke Adaptor, One Packing Nut, and One Stem Adaptor)                                                                                                         | 3.5                       |

1. lb x 0.454 = kg.

### Technical Specifications

| VA-3100 Series Electric Valve Actuators                        |                                  |                                                                                                 |
|----------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------|
| Force Output                                                   |                                  | 675 lb (3,000 N)                                                                                |
| Power Requirements                                             | On/Off (Floating) Control Models | 20 VAC to 28 VAC, 60 Hz; 16 VA Minimum                                                          |
|                                                                | Proportional Control Models      | 20 VAC to 28 VAC, 60 Hz; 18 VA Minimum                                                          |
| Input Signal                                                   | On/Off (Floating) Control Models | 20 VAC to 28 VAC, 60 Hz                                                                         |
|                                                                | Proportional Control Models      | 0 VDC to 10 VDC                                                                                 |
| Input Impedance                                                | Proportional Control Models Only | 5,600 Ohms                                                                                      |
|                                                                |                                  |                                                                                                 |
| Feedback Signal                                                | VA-3100-AGA Only                 | 0 to 2,000 Ohms                                                                                 |
|                                                                | VA-3100-HGC Only                 | Approximately 9 VDC Span (0.5 VDC with Valve Stem Fully Down; 9.5 VDC with Valve Stem Fully Up) |
| Switch Contact Rating                                          |                                  | 5 A, 24 VAC                                                                                     |
| Maximum Stroke                                                 |                                  | 1-21/32 in. (42 mm)                                                                             |
| Nominal Timing for 1 in. Stroke                                |                                  | 92 Seconds                                                                                      |
| Ambient Operating Temperature Limits (Limited by the Actuator) | On/Off (Floating) Control Models | 14°F to 140°F (-10°C to 60°C)                                                                   |
|                                                                | Proportional Control Models      | 14°F to 122°F (-10°C to 50°C)                                                                   |
| Agency Compliance                                              |                                  | UL 873 Listed, File E27734; CSA C22.2 No. 139 Certified                                         |
| Enclosure Rating                                               |                                  | NEMA 3/3R, IP 54                                                                                |
| Shipping Weight                                                |                                  | 9.7 lb (4.4 kg)                                                                                 |

## VA-6100 Series Electric Valve Actuators

### Description

VA-6100 Series Electric Valve Actuators use a synchronous motor to accurately position Johnson Controls® VG2000 Series Cast Iron Flanged Globe Valves in HVAC and industrial applications. These non-spring-return electric actuators have a 1,350 lb (6,000 N) force output for on/off (floating) or proportional control. Integral auxiliary switches are available to indicate end-stop position or to perform switching functions. Position feedback is also available through an isolated 2,000 ohm potentiometer at a fixed stroke of 1-21/32 in. (42.07 mm). All models feature a manual hand wheel for manual positioning of the valve, independent of a power supply.

Refer to the *VA-6100 Series Electric Valve Actuators Product Bulletin (LIT-977284)* for important product application information.

- on/off (floating) or proportional control allows optimal choice of control signal
- adjustable starting point, span, and action (proportional control model only) provides application flexibility and allows for easy sequencing from only one output signal
- 0 VDC to 10 VDC or 0 mA to 20 mA position feedback signal (proportional control model only) provides accurate valve position indication in response to an input signal up to 10 VDC or 20 mA
- auxiliary switches and feedback potentiometer available on select models provides independent verification of actuator position
- manual hand wheel allows for manual positioning of the valve, independent of a power supply

### Repair Information

If the VA-6100 Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls representative.



VA-6100 Series Electric Valve Actuator

### Features

- synchronous motor with pressure switches provides a constant running speed and establishes fixed closeoff forces
- two-bolt coupler clamp provides quick and easy coupling of the actuator to the valve stem

### Selection Chart

| Description                                     | Actuator Model |             |
|-------------------------------------------------|----------------|-------------|
|                                                 | VA-6100-AGC    | VA-6100-HGC |
| On/Off (Floating) Control                       | ■              | —           |
| Proportional Control                            | —              | ■           |
| Feedback:                                       |                |             |
| 2,000 Ohm Potentiometer                         | ■              | —           |
| Two Auxiliary Switches                          | ■              | ■           |
| 0 VDC to 10 VDC or 0 mA to 20 mA Output         | —              | ■           |
| Stem and Valve Size:                            |                |             |
| N Stem (1/2 in.),<br>4 in. through 6 in. Valves | ■              | ■           |

### Accessories

| Code Number | Description                                                                                                                                                                                                                                    | Ship. Wt., lb <sup>1</sup> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| VA-3100-501 | Mounting Kit for Field Mounting VA-6100 Series Electric Actuators to 5 in. and 6 in. VG2000 Series Cast Iron Flanged Globe Valves with 1/2 in. N Stem (Kit Includes One Stem Jam Nut, One Yoke Adaptor, One Packing Nut, and One Stem Adaptor) | 3.5                        |

1. 1 lb x 0.454 = kg.

### Technical Specifications

| VA-6100 Series Electric Valve Actuators                        |                  |                                                                                                                                                                                                  |
|----------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Force Output                                                   |                  | 1,350 lb (6,000 N)                                                                                                                                                                               |
| Power Requirements                                             | VA-6100-AGC Only | 20 VAC to 28 VAC, 60 Hz;<br>37 VA Minimum                                                                                                                                                        |
|                                                                | VA-6100-HGC Only | 20 VAC to 28 VAC, 60 Hz;<br>42 VA Minimum                                                                                                                                                        |
| Input Signal                                                   | VA-6100-AGC Only | 20 VAC to 28 VAC, 60 Hz                                                                                                                                                                          |
|                                                                | VA-6100-HGC Only | 0 VDC to 10 VDC or 0 mA to 20 mA;<br>Minimum Control Signal<br>Adjustable 0 VDC to 8 VDC or 0 mA to 16 mA;<br>Maximum Control Signal<br>Adjustable 2 VDC to 10 VDC or 4 mA to 20 mA <sup>1</sup> |
| Input Impedance                                                | VA-6100-HGC Only | 10,000 Ohms with 0 VDC to 10 VDC Input;<br>500 Ohms with 0 mA to 20 mA Input                                                                                                                     |
| Feedback Signal                                                | VA-6100-AGC Only | 0 to 2,000 Ohms                                                                                                                                                                                  |
|                                                                | VA-6100-HGC Only | 0.35 VDC to 9.65 VDC or 0.7 mA to 19.3 mA                                                                                                                                                        |
| Switch Contact Rating                                          |                  | 5 A, 24 VAC                                                                                                                                                                                      |
| Maximum Stroke                                                 |                  | 1-21/32 in. (42 mm)                                                                                                                                                                              |
| Nominal Timing for 1-1/2 in. Stroke                            |                  | 111 Seconds                                                                                                                                                                                      |
| Ambient Operating Temperature Limits (Limited by the Actuator) |                  | -4°F to 140°F (-20°C to 60°C)                                                                                                                                                                    |
| Agency Compliance                                              |                  | UL 873 Listed, File E27734, CCN XAPX;<br>cUL C22.2 No. 24-93 Listed, File E27734, CCN XAPX7                                                                                                      |
| Enclosure Rating                                               |                  | NEMA 4, IP 65                                                                                                                                                                                    |
| Shipping Weight                                                |                  | 16.5 lb (7.5 kg)                                                                                                                                                                                 |

1. The maximum control signal must always exceed the minimum control signal by at least 2 VDC or 4 mA.

## M9000-53x Series Cast Iron Flanged Valve Linkage Kits

### Description

The M9000-53x Series Cast Iron Flanged Valve Linkage Kits are designed specifically for field mounting M9116 and M9124 Series Non-Spring-Return (NSR) and M9220 Series Spring-Return (SR) Electric Actuators to VG2000 Series Cast Iron Flanged Valves of sizes 2-1/2 in. through 6 in. Kits are available to fit older Johnson Controls® valves for easy conversion from pneumatic or older electric actuator installations.

Refer to the *M9000-53x Series Cast Iron Flanged Valve Linkage Kit for M9000 Series Electric Actuators Product Bulletin (LIT-1201538)* for important product application information.

### Features

- Dedicated Models — facilitate quick and easy installation regardless of the valve stroke and electric actuator chosen.
- Single Anti-Rotation Bracket — allows one linkage to accommodate spring-return and non-spring-return electric actuators.
- Two-Bolt Coupler Clamp — provides quick and easy coupling of the linkage to the valve stem.
- Easy to Convert from Single to Tandem Actuators — accommodates changing shutoff requirements.

### Repair Information

If the M9000-53x Series Linkage Kit fails to operate within its specifications, replace the unit. For a replacement kit, contact the nearest Johnson Controls representative.



**VG2x31 Valves with M9000 Series Electric Valve Actuators**

### Selection Chart

| Valve Size, in. | Valve Code Number                | Discontinued Valve Code Numbers That Are Compatible with Linkage Kit                                                  | Nominal Valve Stroke, in. | Valve Stem Diameter, in. | Actuator Series <sup>1</sup> | Number of Actuators Required | Linkage Kit Code Number             |
|-----------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|------------------------------|------------------------------|-------------------------------------|
| 2-1/2           | VG2231TM<br>VG2431TM<br>VG2831TM | V-5252-4, -5, -6, -7, -8, -32, -33<br>V-5462-6, -7, -34<br>V-5842-7, -8, -31<br>VB-3752-19<br>VB-3970-11<br>VB-4322-9 | 3/4                       | 3/8                      | M9116<br>M9124<br>M9220      | 1                            | M9000-530 <sup>2</sup>              |
| 3               | Not Applicable                   | V-5252-9, -10, -11, -34                                                                                               |                           |                          | M9124<br>M9220               |                              | M9000-530                           |
| 3               | VG2231UM<br>VG2431UM<br>VG2831UM | V5252-12, -13, -35<br>V-5462-8, -9, -35<br>V-5842-9, -10, -32<br>VB-3752-22<br>VB-3970-14<br>VB-4322-11               | 1-1/8                     |                          | M9116<br>M9124<br>M9220      |                              | M9000-531 <sup>3</sup>              |
|                 | VG2231UN<br>VG2431UN<br>VG2831UN | V-5462-10, -36<br>V-5842-17, -18, -33                                                                                 |                           | 1/2                      | M9124<br>M9220               | 2                            | M9000-532<br>M9000-537              |
| 4               | VG2231VM<br>VG2431VM<br>VG2831VM | V-5252-14, -36<br>V-5462-11, -12, -37<br>V-5842-9, -10, -32<br>VB-3752-25<br>VB-3970-17<br>VB-4322-13                 |                           | 3/8                      |                              | 1<br>2                       | M9000-531 <sup>3</sup><br>M9000-532 |
|                 | VG2231VN<br>VG2431VN<br>VG2831VN | V-5252-15, -16, -37<br>V-5462-13, -14, -38<br>V-5842-11, -12, -34                                                     |                           | 1/2                      |                              |                              | M9000-537                           |
| 5               | VG2231WN<br>VG2431WN<br>VG2831WN | V-5252-17, -18, -38<br>V-5462-15, -16, -39<br>V-5842-13, -14, -35<br>VB-3752-28<br>VB-3970-20<br>VB-4322-19           | 1-3/8                     |                          |                              | 1<br>2                       | M9000-533 <sup>3</sup><br>M9000-534 |
| 6               | VG2231YN<br>VG2431YN<br>VG2831YN | V-5252-19, -39<br>V-5462-17, -18, -40<br>V-5842-15, -16, -36<br>VB-3752-31<br>VB-3970-23<br>VB-4322-18                | 1-1/2                     |                          |                              | 1<br>2                       | M9000-535 <sup>3</sup><br>M9000-536 |

1. M9116 and M9124 Series Electric Actuators are non-spring return. M9220 Series Electric Actuators are spring return.

2. The M9000-530 cannot be retrofitted with the M9000-610 Tandem Adapter Kit.

3. Linkages can be retrofitted with a tandem actuator using an M9100-610 Tandem Adapter Kit.

## M9000-53x Series Cast Iron Flanged Valve Linkage Kits (Continued)

### Technical Specifications

| M9000-53x Series Cast Iron Flanged Valve Linkage Kits                           |           |                                                                                                                                                                   |
|---------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Force Output                                                                    | M9000-530 | 378 lb (1,684 N) Minimum with M9116 Series Actuator<br>605 lb (2,691 N) Minimum with M9124 Series Actuator<br>457 lb (2,035 N) Minimum with M9220 Series Actuator |
|                                                                                 | M9000-531 | 238 lb (1,060 N) Minimum with M9116 Series Actuator<br>380 lb (1,694 N) Minimum with M9124 Series Actuator<br>288 lb (1,281 N) Minimum with M9220 Series Actuator |
|                                                                                 | M9000-532 | 761 lb (3,385 N) Minimum with Tandem M9124 Series Actuators<br>576 lb (2,562 N) Minimum with Tandem M9220 Series Actuators                                        |
|                                                                                 | M9000-533 | 315 lb (1,405 N) Minimum with M9124 Series Actuator                                                                                                               |
|                                                                                 | M9000-534 | 631 lb (2,806 N) Minimum with Tandem M9124 Series Actuators<br>477 lb (2,121 N) Minimum with Tandem M9220 Series Actuators                                        |
|                                                                                 | M9000-535 | 280 lb (1,248 N) Minimum with M9124 Series Actuator                                                                                                               |
|                                                                                 | M9000-536 | 561 lb (2,495 N) Minimum with Tandem M9124 Series Actuators<br>424 lb (1,887 N) Minimum with Tandem M9220 Series Actuators                                        |
|                                                                                 | M9000-537 | 761 lb (3,385 N) Minimum with Tandem M9124 Series Actuators<br>576 lb (2,562 N) Minimum with Tandem M9220 Series Actuators                                        |
| Valve Stroke                                                                    | M9000-530 | 3/4 in. (19 mm) Nominal                                                                                                                                           |
|                                                                                 | M9000-531 | 1-1/8 in. (29 mm) Nominal                                                                                                                                         |
|                                                                                 | M9000-532 | 1-1/8 in. (29 mm) Nominal                                                                                                                                         |
|                                                                                 | M9000-533 | 1-3/8 in. (35 mm) Nominal                                                                                                                                         |
|                                                                                 | M9000-534 | 1-3/8 in. (35 mm) Nominal                                                                                                                                         |
|                                                                                 | M9000-535 | 1-1/2 in. (38 mm) Nominal                                                                                                                                         |
|                                                                                 | M9000-536 | 1-1/2 in. (38 mm) Nominal                                                                                                                                         |
|                                                                                 | M9000-537 | 1-1/8 in. (29 mm) Nominal                                                                                                                                         |
| Minimum Ambient Operating Temperature<br>(Limited by the Valve)                 |           | 35°F (2°C) in Water and Steam Applications                                                                                                                        |
| Maximum Ambient Operating Temperature <sup>1</sup><br>(Limited by the Actuator) |           | 122°F (50°C) M91xx Series Actuators<br>131°F (55°C) M9220 Series Actuators                                                                                        |
| Shipping Weight                                                                 |           | 7-1/2 lb (3.4 kg)                                                                                                                                                 |

1. In steam applications, install the valve with the stem horizontal to the piping, and wrap the valve with insulation.

# VG2000 Series Cast Iron Flanged Globe Valves, Maintenance and Repair

## Selection Chart

| Code Number                                                      | Description                                                                                                                                                                                                                                                                      | Ship Weight, lb <sup>1</sup> |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Packing Kits</b>                                              |                                                                                                                                                                                                                                                                                  |                              |
| V-9999-613                                                       | For 2-1/2 in. through 4 in. Valves with 3/8 in. Stem. Kit Includes: Two Ring Packs (U-Cup with O-Ring Installed), One Follower, One Spacer, Insertion/Removal Tool, One Grease Tube, and One 3 in. (76 mm) Strip of Crocus Cloth.                                                | 0.1                          |
| V-5252-668                                                       | For 3 in. through 6 in. Valves with 1/2 in. Stem. Kit Includes: Two Ring Packs (U-Cup with O-Ring Installed), One Follower, One Spacer Insertion/Removal Tool, One Grease Tube, and One 3 in. (76 mm) Strip of Crocus Cloth.                                                     | 0.2                          |
| <b>Packing Nut Kits (Pneumatically Actuated Assemblies Only)</b> |                                                                                                                                                                                                                                                                                  |                              |
| V-4510-6019                                                      | For 2-1/2 in. through 4 in. Valves with 3/8 in. Stem                                                                                                                                                                                                                             | 0.1                          |
| V-5252-609                                                       | For 3 in. through 6 in. Valves with 1/2 in. Stem                                                                                                                                                                                                                                 | 0.4                          |
| <b>Valve Reconditioning Kits</b>                                 |                                                                                                                                                                                                                                                                                  |                              |
| V-5252-6001                                                      | Reconditioning Kit, 2-1/2 in. N.O. Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 51.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.             | 7.0                          |
| V-5252-6002                                                      | Reconditioning Kit, 2-1/2 in. N.O. Flanged Valve, <b>L</b> Stem (3/8 in.), for Use with MP82 Pneumatic Actuator, Cv = 51.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                  | 6.9                          |
| V-5252-6003                                                      | Reconditioning Kit, 3 in. N.O. Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 83.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                 | 9.5                          |
| V-5252-6004                                                      | Reconditioning Kit, 3 in. N.O. Flanged Valve, <b>L</b> Stem (3/8 in.), for Use with MP82 Pneumatic Actuator, Cv = 83.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                      | 9.5                          |
| V-5252-6005                                                      | Reconditioning Kit, 4 in. N.O. Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 150.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, Grease Packet.                    | 15.0                         |
| V-5252-6006                                                      | Reconditioning Kit, 4 in. N.O. Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 150.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                     | 16.5                         |
| V-5252-6007                                                      | Reconditioning Kit, 5 in. N.O. Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 240.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                     | 22.0                         |
| V-5252-6008                                                      | Reconditioning Kit, 6 in. N.O. Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 350.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                     | 30.6                         |
| V-5462-6001                                                      | Reconditioning Kit, 2-1/2 in. N.C. Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 54.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.             | 7.4                          |
| V-5462-6002                                                      | Reconditioning Kit, 3 in. N.C. Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 83.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                 | 9.9                          |
| V-5462-6003                                                      | Reconditioning Kit, 3 in. N.C. Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 83.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                      | 12.7                         |
| V-5462-6004                                                      | Reconditioning Kit, 4 in. N.C. Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 150.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, Grease Packet.                    | 16.3                         |
| V-5462-6005                                                      | Reconditioning Kit, 4 in. N.C. Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 150.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                     | 17.4                         |
| V-5462-6006                                                      | Reconditioning Kit, 5 in. N.C. Flanged Valve, <b>N</b> Stem, (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 237.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                    | 23.7                         |
| V-5462-6007                                                      | Reconditioning Kit, 6 in. N.C. Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 344.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                     | 31.1                         |
| V-5842-6001                                                      | Reconditioning Kit, 2-1/2 in. Three-Way Mixing Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 54.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet. | 8.1                          |
| V-5842-6002                                                      | Reconditioning Kit, 3 in. Three-Way Mixing Flanged Valve, <b>M</b> Stem (3/8 in.), for Use with MP84 Pneumatic Actuator or Electric Actuator, Cv = 80.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.     | 10.8                         |
| V-5842-6003                                                      | Reconditioning Kit, 3 in. Three-Way Mixing Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 80.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                          | 12.3                         |
| V-5842-6004                                                      | Reconditioning Kit, 4 in. Three-Way Mixing Flanged Valve, for Use with Electric Actuator, Cv = 157.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                                                        | 16.6                         |
| V-5842-6005                                                      | Reconditioning Kit, 4 in. Three-Way Mixing Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 157.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                         | 17.8                         |
| V-5842-6006                                                      | Reconditioning Kit, 5 in. Three-Way Mixing Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 238.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                         | 22.0                         |
| V-5842-6007                                                      | Reconditioning Kit, 6 in. Three-Way Mixing Flanged Valve, <b>N</b> Stem (1/2 in.), for Use with MP86 Pneumatic Actuator, Cv = 347.0; Includes: Bonnet and Packing Items, Stem and Disk Assembly, Packing Tools, Gasket and Screw Set, and Grease Packet.                         | 31.9                         |

1. lb x 0.454 = kg.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. [www.johnsoncontrols.com](http://www.johnsoncontrols.com)