

## Ball Valve Linkage Kits

### Description

M9000-5xx Series Valve Linkage Kits are designed specifically for field mounting Johnson Controls® M9104, M9106, M9109, and M9100 Series Non-Spring Return (NSR) and M9206, M9210, and M9220 Series Spring Return (SR) Electric Actuators to Johnson Controls VG1000 Series Ball Valves in sizes 1/2 through 4 in. (DN15 through DN100). These sturdy linkage kits provide stable actuator mounting while preventing loading on the valve stem and stem seals to ensure longer seal life.

Refer to the appropriate Product Bulletin for the linkage kit you are using for important product application information.

### Features

#### M2000-500 Linkage

- thermoplastic linkage provides superior thermal isolation between valve and actuator, and meets UL 94-5V Flame Class Rating
- compact size and multi-position setup allows the user to position the actuator and linkage kit assembly in 90° increments, relative to the ball valve, facilitating installation in confined locations
- pointer provides an indication of valve position

#### M9000-51x Linkage

- sturdy aluminum construction provides exceptional strength and stability
- multi-position setup facilitates installation in confined areas

#### M9000-520 Linkage

- glass-reinforced thermoplastic resin provides superior thermal isolation between the valve and actuator, and meets UL 94-5V Flame Class Rating
- two-position anti-rotation slider accommodates both spring return and non-spring return electric actuators
- multi-position setup allows the actuator and linkage kit assembly to be positioned in 90° increments relative to the ball valve, facilitating installation in confined locations
- manual handle for non-spring return applications allows manual positioning of the actuator when power is disengaged

#### M9000-550 Linkage

- thermoplastic linkage provides superior thermal isolation between valve and actuator, and meets UL 94-5V Flame Class Rating
- compact size and multi-position setup allows the user to position the actuator and linkage kit assembly in 90° increments relative to the ball valve, facilitating installation in confined locations
- manual handle for non-spring return applications allows manual positioning of the actuator when power is disengaged



**VG1000 Ball Valve Assemblies with M9000-5xx and M2000-500 Linkages**

## Selection Charts

### Linkage Kits (Part 1 of 2)

Valve Size, in. (DN)	Valve Code Number	Actuator Base Number <sup>1</sup>	Linkage Kit Code Number	Optional Weathershield	
1/2 (DN15)	VG1241Ax, VG1245Ax, VG1841Ax, VG1845Ax	VA9104 <sup>2</sup> , VA2202	None Required	N/A	
		M9104 <sup>2</sup>	<b>M9000-550</b>		
		M2202	<b>M2000-500</b>		
		M9106 <sup>2</sup> , M9206	<b>M9000-520</b>		
		M9108	<b>M9000-516</b>		M9000-330
		M9210	<b>M9000-517</b>		M9000-340
3/4 (DN20)	VG1241Bx, VG1245Bx, VG1841Bx, VG1845Bx	VA9104 <sup>2</sup> , VA2202	None Required	N/A	
		M9104 <sup>2</sup>	<b>M9000-550</b>		
		M2202	<b>M2000-500</b>		
		M9106 <sup>2</sup> , M9206	<b>M9000-520</b>		
		M9108	<b>M9000-516</b>		M9000-330
		M9210	<b>M9000-517</b>		M9000-340
1 (DN25)	VG1241Cx, VG1245Cx, VG1841Cx, VG1845Cx	VA9104	None Required	N/A	
		M9104	<b>M9000-550</b>		
		M9106 <sup>2</sup> , M9206	<b>M9000-520</b>		
		M9108	<b>M9000-516</b>		M9000-330
		M9210	<b>M9000-517</b>		M9000-340

## M2000-500 and M9000-5xx Series Ball Valve Linkage Kits (Continued)

### Linkage Kits (Part 2 of 2)

Valve Size, in. (DN)	Valve Code Number	Actuator Base Number <sup>1</sup>	Linkage Kit Code Number	Optional Weathershield
1-1/4 (DN32)	VG1241Dx, VG1245Dx, VG1841Dx, VG1845Dx	M9106 <sup>2</sup> , M9206	<b>M9000-520</b>	N/A
		M9108	<b>M9000-516</b>	M9000-330
		M9210	<b>M9000-517</b>	M9000-340
1-1/2 (DN40)	VG1241Ex, VG1245Ex, VG1841Ex, VG1845Ex	M9106 <sup>2</sup> , M9206	<b>M9000-520</b>	N/A
		M9108	<b>M9000-516</b>	M9000-330
		M9210	<b>M9000-517</b>	M9000-340
2 (DN50)	VG1241Fx, VG1245Fx, VG1841Fx, VG1845Fx	M9109 <sup>2</sup>	<b>M9000-520</b>	N/A
		M9116	<b>M9000-516</b>	M9000-330
		M9210	<b>M9000-517</b>	M9000-340
2-1/2 (DN65)	VG12A5Gx	M9124	<b>M9000-518</b>	M9000-330
		M9220	<b>M9000-519</b>	M9000-340
3 (DN80)	VG12A5Hx	M9124	<b>M9000-518</b>	M9000-330
		M9220	<b>M9000-519</b>	M9000-340
4 (DN100)	VG12A5Jx	M9124	<b>M9000-518</b>	M9000-330
		M9220	<b>M9000-519</b>	M9000-340

- M9104, M9106, M9109, and M9100 Series are Non-Spring Return Actuators; M9206, M9210, and M9220 Series are Spring Return Actuators.
- To avoid excessive wear or drive time on the motor for the AGx models, use a controller or software that provides a timeout function to remove the signal at the end of rotation (stall). The IGx and GGx models have an auto shutoff to avoid excessive wear or drive time on the motor.

### Linkages for Discontinued Series Ball Valves

Valve Size, in. (DN)	Valve Code Number	Actuator Base Number	Linkage Kit Code Number
1/2 (DN15)	VG1243Ax, VG1644AB	M9106	<b>M9000-514</b>
		M9206	<b>M9000-515</b>
		M9108	<b>M9000-516</b>
3/4 (DN20)	VG1243Bx	M9106	<b>M9000-514</b>
		M9206	<b>M9000-515</b>
		M9108	<b>M9000-516</b>
	VG1644BB	M9108	<b>M9000-516</b>
		M9210	<b>M9000-517</b>
1 (DN25) 1-1/4 (DN32)	VG1243Cx, VG1243Dx	M9116	<b>M9000-516</b>
		M9220	<b>M9000-517</b>
	VG1644CB, VG1644DB	M9116	<b>M9000-518</b>
		M9220	<b>M9000-519</b>
1-1/2 (DN40)	VG1243Ex, VG1644EB	M9124	<b>M9000-518</b>

## Repair Information

### Repair Parts

Linkage	Replacement Description	Replacement Part Code Number
M9000-51x	Unit replacement	—
M9000-520	Anti-Rotation Slider, includes carriage screw, washers, and wing nut	<b>M9000-600</b>
	M5 Mounting Screws and Nuts	<b>M9000-601</b>
	Drive Shaft	<b>M9000-602</b>
	Manual Handle and Mounting Screw	<b>M9000-603</b>
M2000-500 M9000-550	Unit Replacement	—

**M2000-500 and M9000-5xx Series Ball Valve Linkage Kits (Continued)**
**Technical Specifications**

<b>M2000-500 and M9000-5xx Series Ball Valve Linkage Kits</b>		
<b>Service<sup>1</sup></b>		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 15 psig (103 kPa) Saturated Steam for HVAC Systems
<b>Maximum Actuator Fluid Temperature Limit</b>	212°F (100°C)	M2000-500 Linkage: M2202 Series Spring Return Actuators
		M9000-550 Linkage: M9104 Series Non-Spring Return Actuators
	284°F (140°C)	M9000-516 Linkage: M9100 Series Non-Spring Return Actuators
		M9000-517 Linkage: M9210 Series Spring Return Actuators
		M9000-518 Linkage: M9124 Series Non-Spring Return Actuators
		M9000-519 Linkage: M9220 Series Spring Return Actuators
M9000-520 Linkage: M9106 and M9109 Series Non-Spring Return Actuators and M9206 Series Spring Return Actuators		
<b>Maximum Steam Service<sup>2</sup></b>	Not Rated for Steam Service	M2000-500 Linkage: M2202 Series Spring Return Actuators M9000-550 Linkage: M9104 Series Non-Spring Return Actuators
	15 psig Saturated Steam (250°F, 121°C)	M9000-516 Linkage: M9100 Series Non-Spring Return Actuators
		M9000-517 Linkage: M9210 Series Spring Return Actuators
	25 psig Saturated Steam (267°F, 130°C)	M9000-520 Linkage: M9106 and M9109 Series Non-Spring Return Actuators and M9206 Series Spring Return Actuators
		M9000-518 Linkage: M9124 Series Non-Spring Return Actuators
	M9000-519 Linkage: M9220 Series Spring Return Actuators	
<b>Minimum Ambient Operating Temperature</b>	-25°F (-32°C)	M9000-520 Linkage: M9206 Series Spring Return Actuators
	-22°F (-30°C)	M2000-500 Linkage: M2202 Series Spring Return Actuators
	-4°F (-20°C)	M9000-510 Linkage: M9216-AGx-2 and M9216-Bxx-2 Spring Return Actuators
		M9000-516 Linkage: M9100 Series Non-Spring Return Actuators
	-40°F (-40°C)	M9000-518 Linkage: M9124 Series Non-Spring Return Actuators
		M9000-517 Linkage: M9210 Series Spring Return Actuators
M9000-519 Linkage: M9220 Series Spring Return Actuators		
<b>Maximum Ambient Operating Temperature</b>	122°F (50°C)	M2000-500 Linkage: M2202 Series Spring Return Actuators
		M9000-516 Linkage: M9100 Series Non-Spring Return Actuators
		M9000-518 Linkage: M9124 Series Non-Spring Return Actuators
	125°F (52°C)	M9000-520 Linkage: M9106 and M9109 Series Non-Spring Return Actuators
	131°F (55°C)	M9000-517 Linkage: M9210 Series Spring Return Actuators
		M9000-519 Linkage: M9220 Series Spring Return Actuators
140°F (60°C)	M9000-520 Linkage: M9206 Series Spring Return Actuators M9000-550 Linkage: M9104 Series Non-Spring Return Actuators	
<b>Enclosure</b>		NEMA 3R, IP32
<b>Material</b>	M9000-550, M9000-520	Glass-Reinforced Thermoplastic Resin; UL 94 5V Flame Class Rating
	M9000-51x	Bracket: Aluminum Anti-Rotation Slider: 1018 Steel Drive Shaft: 12L14 Steel Standoff: Thermoplastic Resin Thermal Spacer: Polytetrafluoroethylene (PTFE)
<b>Shipping Weight</b>		1.5 lb (0.68 kg)

1. Refer to VDI 2035 Standard for recommended proper water treatment.

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