

# VA9905 Series Actuators - VG1600 Series 270° Six-Way Ball Valves

## Description

The VA9905 Series Electric Non-Spring Return Actuators are direct-mount actuators for VG1600 Series 270° Six-Way Ball Valves.

The easy-to-use mounting system of the VA9905 Series Electric Non-Spring Return Actuator and VG1600 Series 270° Six-Way Ball Valve reduces mistakes in the installation due to its intuitive assembly mechanism. The actuator is guided by plastic post and tabs that align with the valve flange and stem notch for proper installation.

VG1600 Series 270° Six-Way Ball Valves are designed to easily and efficiently regulate the flow of both hot and chilled water in response to the demand of a controller in HVAC systems. It is a proportional 24 V AC/DC actuator with Brushless DC Motor Technology.

The 270° Six-Way Valve substitutes either four through valves or two through valves and one change-over valve. The true close-off feature, which is internal to the valve, isolates the Source 1 circuit from the Source 2 circuit.

The VG1600 is supplied with control flow disks providing the right flow rate for a wide range of applications. Available in 1/2 inch and 3/4 inch sizes, the valve is operated by a 270° rotary proportional actuator non-spring return.

Refer to the *VA9905 and VG1600 Product Bulletin (LIT-12012553)* for important product application information.

## Features

### VA9905 Actuator

- 2 Analog Inputs
- Microprocessor-Controlled Brushless DC Motor
- Mode Configuration Switches
- Simplified installation and field wiring
- Plenum-Rated Models
- Small Footprint
- NEMA5/IP54 Enclosure
- Position Indicator Handle and Manual Override
- Manufactured under ISO-9001 Quality Control Standards
- UL, CE Mark, and RCM Compliance
- 100,000 Cycles and 2.5 Million Repositions
- 5-Year Warranty

### VG1600 270° Six-Way Ball Valves

- Available in NPT (internal), BSPP (external) and Sweat Union Fittings
- Forged Brass Body
- Ethylene Propylene Diene Monomer (EPDM) Double O-Ring Stem Seal
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats
- Maintenance – Free Design
- 100,000 full stroke cycles in iron oxide contaminated water
- Various valve configurations with just one valve size
- Available in 1/2 inch and 3/4 inch sizes
- Factory- Mounted VA9905 Series Electric Actuator



VA9905 Actuator and VG1600 6-way Valve

## Repair Information

If the VA9905 Series Actuator or VG1600 Series 270° Six-Way Ball Valve fails to operate within its specifications, replace the unit. For a replacement VA9905 Actuator or VG1600 Ball Valve, contact the nearest Johnson Controls® representative.

### 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

## Selection Chart

### Valves and Actuators Ordering Codes

Code Number	Description
VG1641AF	Six-Way Ball Valve with 1/2" NPT internal threads
VG1671AF	Six-Way Ball Valve with 1/2" BSPP external threads + 6x Sweat Union Fitting
VG1641BL	Six-Way Ball Valve with 3/4" NPT internal threads
VG1671BL	Six-Way Ball Valve with 3/4" BSPP external threads + 6x Sweat Union Fitting
VA9905-KGA-2	Proportional Actuator 5Nm with 2x0(2)...10 V Analog Inputs
VG1641AF+905KGA	Proportional Actuator 5Nm with 2x0(2)...10 V Analog Inputs + Six-Way Ball Valve 1/2" NPT internal threads
VG1671AF+905KGA	Proportional Actuator 5Nm with 2x0(2)...10 V Analog Inputs + Six-Way Ball Valve 1/2" BSPP external threads + 6x Sweat Union Fitting
VG1641BL+905KGA	Proportional Actuator 5Nm with 2x0(2)...10 V Analog Inputs + Six-Way Ball Valve 3/4" NPT internal threads
VG1671BL+905KGA	Proportional Actuator 5Nm with 2x0(2)...10 V Analog Inputs + Six-Way Ball Valve 3/4" BSPP external threads + 6x Sweat Union Fitting

### Accessories Ordering Codes

Code Number	Description
VG1600-01	Mounting Bracket
VG1600-02	1/2" Flow Disk Kit (2 x flow disk sets + 2 x ring nut)
VG1600-03	1/2" Insulation Shell
VG1600-04	1/2" Sweat Union Fitting kits (6x sweat union fitting)
VG1600-05	3/4" Flow Disk Kit (2 x flow disk sets + 2 x ring nut)
VG1600-06	3/4" Insulation Shell
VG1600-07	3/4" Sweat Union Fitting kits (6x sweat union fitting)



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

## VA9905 Series Actuators - VG1600 Series 270° Six-Way Ball Valves (Continued)

### Technical Specifications

#### VA9905 Actuator

<b>Product description</b>	VA9905-KGA-2: Proportional mode
<b>Power requirements</b>	AC 24 V $\pm$ 20% at 50/60 Hz, Class 2 (North America) or SELV (Europe), 4.7 VA Running; DC 24 V $\pm$ 10% Class 2 (North America) or SELV (Europe), 1.4 W Running.
<b>Transformer sizing requirements</b>	$\geq$ 6 VA
<b>Input signal/adjustments</b>	0 (2) to 10 VDC or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor
<b>Control impedance</b>	100k ohm
<b>Rotation rate</b>	1.5 ° per second
<b>Cycles</b>	100,000 full stroke cycles; 2,500,000 repositions
<b>Audible noise</b>	<35 dBA at 1 m (39-13/32 in.)
<b>Electrical connections</b>	120 in. (3.05 m ) UL 444 type CMP plenum rated cable with 0.75 mm <sup>2</sup> (19 AWG cable) conductors and 0.25 in. (6 mm) ferrule ends
<b>Conduit connections</b>	1/2 in. NPSM threaded conduit
<b>Ambient conditions</b>	Operating: 32 to 140°F (0 to 60°C), 90% RH, noncondensing, Storage: -40 to 185°F (-40 to 85°C), 95% RH, noncondensing
<b>Enclosure</b>	IP54/NEMA 5
<b>Dimensions</b>	Width: 3-1/2 in. (89 mm), Height: 2-15/16 in. (74 mm), Length: 5-11/16 in. (170mm)
<b>Shipping weight</b>	1.75 lbs (0.8 Kg)
<b>Compliance</b>	<p><b>United States:</b> UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators, Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code.</p> <p><b>Canada:</b> UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.</p> <p><b>Europe:</b> CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive. IEC 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements and IEC 60730-2-14, Automatic Electrical Controls for Household and Similar Use; Part 2—Particular Requirements for Electric Actuators</p> <p><b>Australia and New Zealand:</b> RCM—Australia/NZ Emissions Compliant</p>

#### VG1600 Six-Way Ball Valve

	VG16x1AF	VG16x1BL
<b>Total operation angle</b>	270°	
<b>Sequence 1</b>	0...>90°	
<b>Dead band</b>	>90...<180°	
<b>Sequence 2</b>	>180...270°	
<b>Characteristic curve</b>	Linear	
<b>ID</b>	10.5 mm	15mm
<b>Fluid type</b>	Water, glycol solutions (max 50%) for HVAC applications	
<b>Fluid temperature</b>	41 to 203 °F (5 to 95 °C )	
<b>Nominal pressure</b>	232 psi (PN16)	
<b>Close off pressure</b>	50 psi (350 kPa)	
<b>Max. differential pressure</b>	35 psi (240 kPa)	
<b>Range ability</b>	100:1	
<b>Max. Cv (Kv)</b>	2.7 (2.3) - 1/2" pipe size	5.2 (4.5) - 3/4" pipe size
<b>Body</b>	Brass CW 617N (UNI EN 12420)	
<b>End Connection</b>	Brass CW 617N (UNI EN 12420)	
<b>Balls</b>	Brass Chrome Plated	
<b>Stems</b>	Brass Chrome Plated	
<b>Ball Seat</b>	PTFE 15% Graphite Filled	
<b>O-ring</b>	EPDM PEROX	
<b>Ring Nut</b>	Brass CW 614N (UNI EN 12164 – UNI EN 12168)	
<b>Connections</b>	1/2 inch BSPP Thread (external), 1/2 inch NPT Thread (internal), or Sweat Union Fitting Kit	3/4 inch BSPP Thread (external), 3/4 inch NPT Thread (internal), or Sweat Union Fitting Kit
<b>Flow coefficient</b>	Flow control disk	
<b>Leakage rate</b>	A, 100,000 cycles in iron-oxide contaminated water and air-bubble-tight (EN 12266-1)	
<b>Water quality</b>	Iron-oxide contaminated water (900ppm)	
<b>Maintenance</b>	Maintenance Free	
<b>Warranty</b>	Minimum 5 years to our customer	
<b>Shipping Weight</b>	VG1641AF: 1.85 lbs (0.8 Kg), VG1671AF: 2.20 lbs (1 Kg)	VG1641BL: 3.69 lbs (1.7 Kg), VG1671BL: 4.13 lbs (1.9 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. © 2018 Johnson Controls. [www.johnsoncontrols.com](http://www.johnsoncontrols.com)