

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 posts 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 multi-input signal 24 V AC/DC actuator with Brushless DC Motor Technology. The actuator can also be configured for thermostat controlled On/Off heating and cooling applications and driven by a 24VAC thermostat or controller.

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 multi-input signal non-spring return actuator.

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

Features

VA9905 Actuator

- Control Options:
 - 2 Analog Inputs
 - 1 Analog Input
 - 2 24VAC 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.

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	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs
VG1641AF+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 1/2" NPT internal threads
VG1671AF+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 1/2" BSPP external threads + 6x Sweat Union Fitting
VG1641BL+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 3/4" NPT internal threads
VG1671BL+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 3/4" BSPP external threads + 6x Sweat Union Fitting

Note: Optional 0(4)...20mA control with field furnished 500 ohm 1/4" resistor for proportional control

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)

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

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

Technical Specifications

VA9905 Actuator

Product description	VA9905-KGA-2 (North America): Multi-Input Signal mode actuator.
Power requirements	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.
Transformer sizing requirements	≥ 6 VA
Input signal/adjustments	0 (2) to 10 VDC or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor for proportional control or 24VAC dual wire on/off control
Control impedance	100k ohm DC, 4.7k ohm AC
Rotation rate	1.5 ° per second
Cycles	100,000 full stroke cycles; 2,500,000 repositions
Audible noise	<35 dBA at 1 m (39-13/32 in.)
Electrical connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 0.75 mm ² (19 AWG cable) conductors and 0.25 in. (6 mm) ferrule ends
Conduit connections	1/2 in. NPSM threaded conduit
Ambient conditions	Operating: 32 to 140°F (0 to 60°C), 90% RH, noncondensing, Storage: -40 to 185°F (-40 to 85°C), 95% RH, noncondensing
Enclosure	IP54/NEMA 5
Dimensions	Width: 3-1/2 in. (89 mm), Height: 2-15/16 in. (74 mm), Length: 5-11/16 in. (170mm)
Shipping weight	1.75 lbs (0.8 Kg)
Compliance	United States: 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. Canada: 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. Europe: 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 Australia and New Zealand: RCM—Australia/NZ Emissions Compliant

VG1600 Six-Way Ball Valve

	VG16x1AF	VG16x1BL
Total operation angle	270°	
Sequence 1	0...>90°	
Dead band	>90...<180°	
Sequence 2	>180...270°	
Characteristic curve	Linear	
ID	10.5 mm	15mm
Fluid type	Water, glycol solutions (max 50%) for HVAC applications	
Fluid temperature	41 to 203 °F (5 to 95 °C)	
Nominal pressure	232 psi (PN16)	
Close off pressure	50 psi (350 kPa)	
Max. differential pressure	35 psi (240 kPa)	
Range ability	100:1	
Max. Cv (Kv)	3.3 (3.8) - 1/2" pipe size	6.3 (7.4) - 3/4" pipe size
Body	Brass CW 617N (UNI EN 12420)	
End Connection	Brass CW 617N (UNI EN 12420)	
Balls	Brass Chrome Plated	
Stems	Brass Chrome Plated	
Ball Seat	PTFE 15% Graphite Filled	
O-ring	EPDM PEROX	
Ring Nut	Brass CW 614N (UNI EN 12164 – UNI EN 12168)	
Connections	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
Flow coefficient	Flow control disk	
Leakage rate	A, 100,000 cycles in iron-oxide contaminated water and air-bubble-tight (EN 12266-1)	
Water quality	Refer to the VDI 2035 Guideline for recommended proper water treatment	
Maintenance	Maintenance Free	
Warranty	Minimum 5 years to our customer	
Shipping Weight	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)

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⚠ 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.

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