FANs 977, 125, 1628.3
Product Bulletin VA-9000
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JOHNSON CONTROLS

VA-9000 Series
Electric Rotary Actuators for Two-Position and Modulating Service

The VA-9000 Series Electric Rotary Actuators are designed for direct mounting in an upright position on VF Series Butterfly Valves. The VA-9000 is available in two different sizes, for two-position and modulating service on 16 through 20 in. high-pressure butterfly valves, and two-position and modulating service on 20 in. low-pressure butterfly valves.

All models feature two independently adjustable travel limit switches for open and closed position, each factory set for 90° valve rotation. Powered by a rugged, high-torque, single-phase reversible motor, the VA-9000 is designed to withstand stall torque for reliable performance in even the most demanding applications. Precision-cut gears and shafts are heat treated, high-alloy steel. Electroless nickel-plated output shafts provide maximum corrosion protection. The watertight actuator enclosure meets NEMA-4 standards.

For VA-9000 Series Actuator sizing recommendations when used on VF Series Butterfly Valves, refer to the VF Series Butterfly Valves 2 Through 20 in., Two-Way and Three-Way Product/Technical Bulletin (LIT-977205P).



Figure 1: VA-9000 Series Electric Rotary Actuator

Features and Benefits

Built-In Motor Overload Protection	Prevents thermal overload of motor
Output Torques of 10,000 or 21,000 lb·in (1,130 or 2,373 N·m)	Provides optimal output torque for larger valve actuation applications
Visual Position Indication and Manual Override	Provides clear and convenient indication of valve position; ensures positive and fast manual operation without the need for tools
Factory-Set Limit Switches	Eliminates the need for field calibration
CSA Approved	Meets requirements of industry standards
Rugged, Die-Cast Aluminum NEMA-4 Enclosure	Provides waterproofing and exceptional corrosion, wear, impact, and UV resistance

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Operation

VA-900x-02 Series Two-Position Electric Actuators (See Figure 2.)

A controller sends a 120 VAC power source to the actuator at terminals 1 and 2 (open) or 1 and 3 (close) depending on the desired movement of the valve. This signal activates the motor, causing the cam post and coupled valve shaft to rotate in the proper direction to accurately position the valve.

When the valve reaches its fully open or closed position, the cams are engaged causing the corresponding limit switch to open and shut off power to the motor. Field calibration of the limit switches is not required.

Note: All VA-900x-02 Series Two-Position Electric Actuators can be positioned manually using the integral handwheel. In addition, an automatic lockout safety switch prevents electrical operation during manual override.



Figure 2: Internal View of a VA-900x-02 Series Two-Position Electric Actuator

VA-900x-01 Series Modulating Electric Actuators (See Figure 3.)

A controller sends a command signal (typically 4 to 20 mA DC) to the actuator terminal board as illustrated in Figure 6. This signal is compared to the actual position of the valve via the feedback potentiometer. The resulting signal activates the motor to rotate the cam post and coupled valve shaft in the proper direction to accurately position the valve.

When the valve reaches its fully open or closed position, the cams are engaged causing the corresponding limit switch to open and shut off power to the motor. Field calibration of the limit switches is not required.

Note: All VA-900x-01 Series Modulating Electric Actuators can be positioned manually using the integral handwheel. In addition, an automatic lockout safety switch prevents electrical operation during manual override.



Figure 3: Internal View of a VA-900x-01 Series Modulating Electric Actuator

Table 1: Model Numbers and Miscellaneous Specifications

Johnson Controls Actuator Code Number	Johnson Controls Actuator Sub-Code	Bray Series Number	Service	Output Torque Value* lb·in (N·m)	Stroke Time in Seconds	Current Rating in Amperes	Shipping Weight lb (kg)
VA-9007-02	-927	S71-0100 On-Off	Two-Position	10,000 (1,130)	30	2.8	34.0 (15.4)
VA-9008-02	-928	S71-0200 On-Off	Two-Position	21,000 (2,373)	55	7.2	93.0 (42.2)
VA-9007-01	-907	S71-0100 Modulating	Modulating	10,000 (1,130)	60	2.8	36.0 (16.3)
VA-9008-01	-908	S71-0200 Modulating	Modulating	21,000 (2,373)	55	7.2	95.0 (43.1)

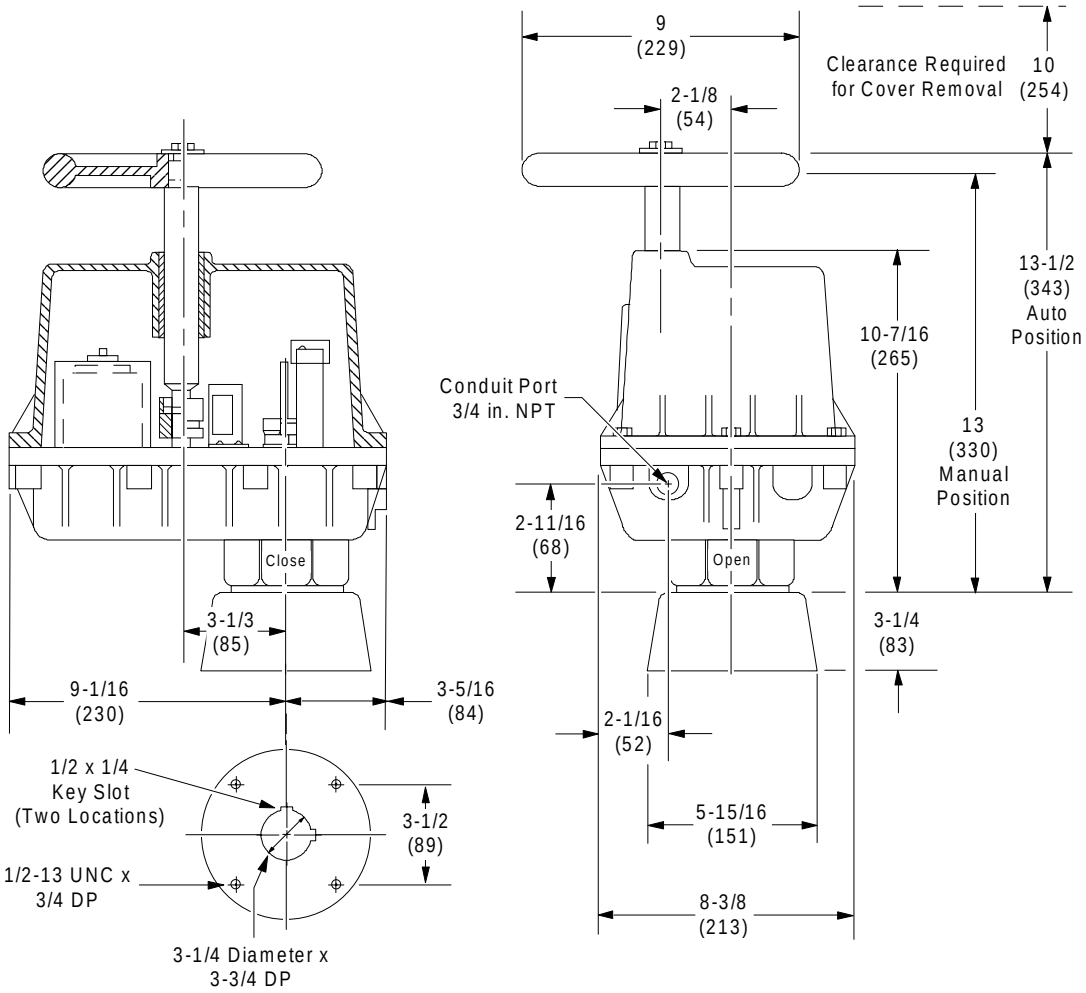


Figure 4: VA-9007-0x Series Electric Rotary Actuators Dimensions, in. (mm)

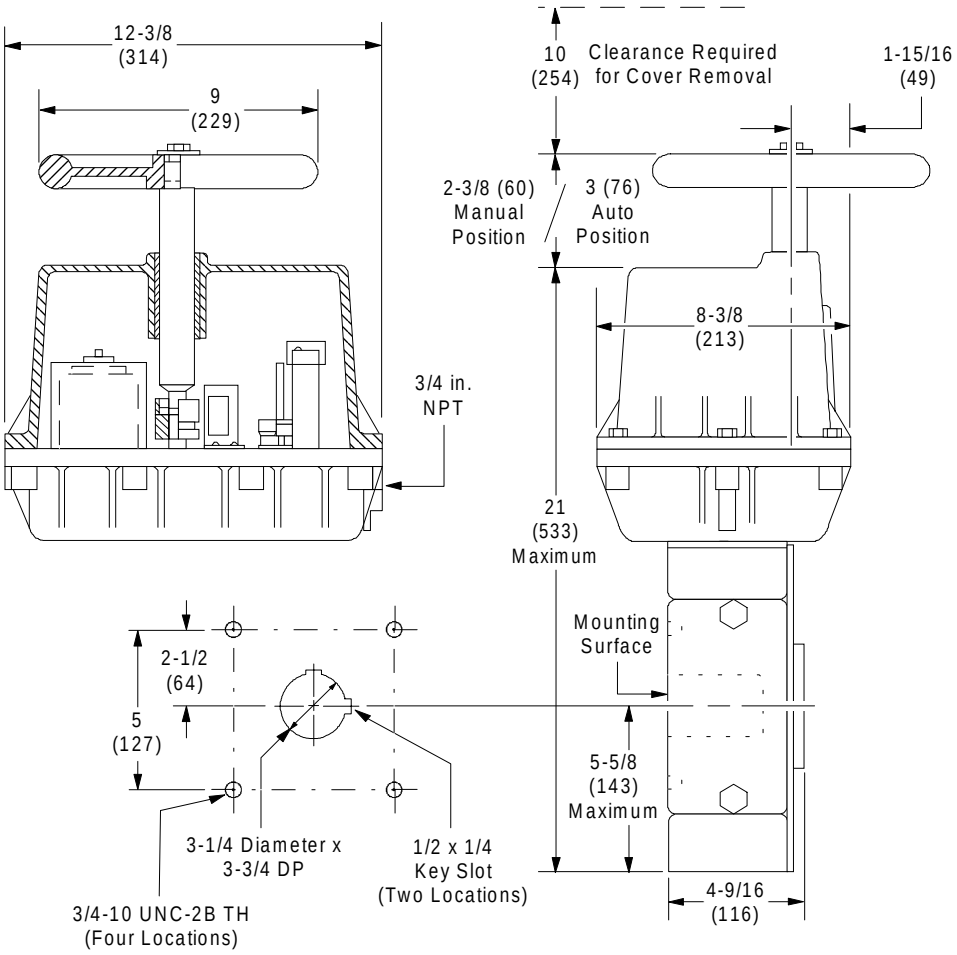


Figure 5: VA-9008-0x Series Electric Rotary Actuators Dimensions, in. (mm)

Installation

The VA-9000 Series Electric Rotary Actuators are pre-sized and factory coupled to Johnson Controls VF Series Butterfly Valves. For installation instructions, refer to the VF Series Butterfly Valves Product/Technical Bulletin (LIT-977205P) and the *VF Series Butterfly Valves 2 Through 20 in., Two-Way and Three-Way Installation Instructions (LIT-977205X)*.

Wiring

All wiring must be in accordance with applicable electrical code requirements. Accessible, clearly marked terminal strips for pigtail connections are provided. Refer to Figures 6 through 8 for more details.

Field Adjustments

Field calibration is not required. Travel limit, span, and bandwidth adjustments have been preset at the factory. To change these factory settings, refer to the *VA-9000 Series Electric Rotary Actuators Commissioning Procedures Technical Bulletin (LIT-977335)*.

Ordering Information

To order a VA-9000 Series Electric Rotary Actuator and VF Series Butterfly Valve Assembly, refer to Table 1 in the VF Series Butterfly Valves Product/Technical Bulletin (LIT-977205P).

Note: For outdoor locations, or ambient temperature environments at or below 32°F (0°C) or ambient humidity environments above 85% RH, an optional heater/thermostat kit must also be ordered. Refer to the VF Series Butterfly Valves Product/Technical Bulletin (LIT-977205P) for more details.

Repairs and Replacements

Refer to Table 2 for a complete listing of accessories and repair parts available. For a replacement VA-9000 Series Electric Rotary Actuator and VF Series Butterfly Valve Assembly, contact your local Johnson Controls representative

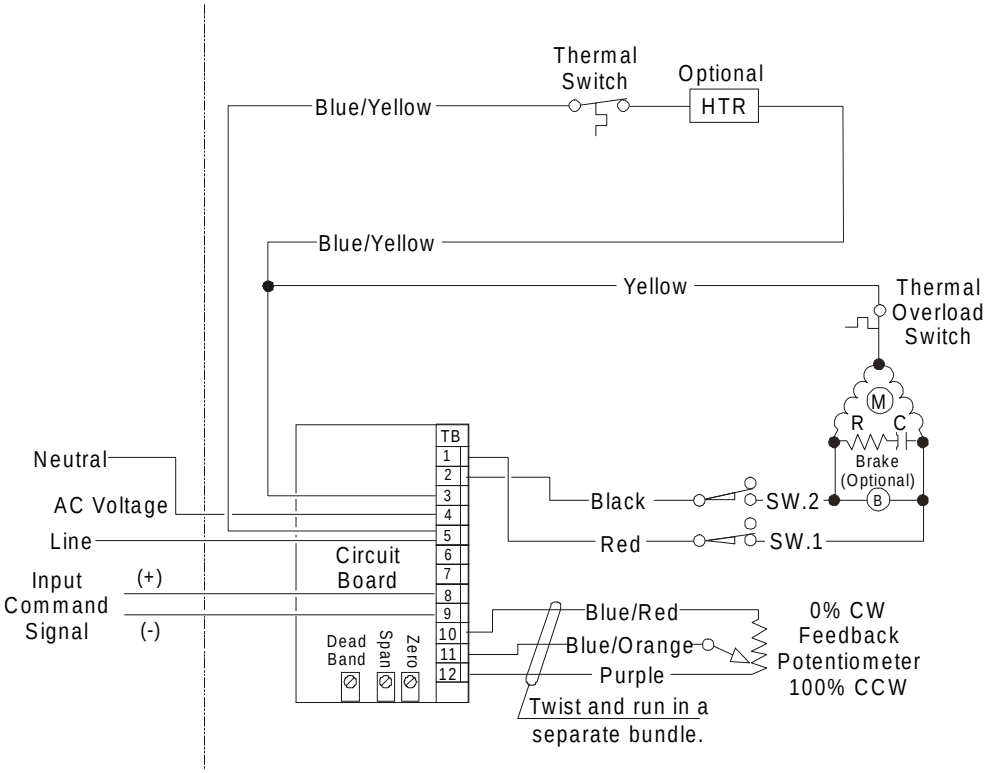


Figure 6: Typical Wiring Schematic for 4 to 20 mA DC Control of a VA-900x-01 Series Modulating Electric Actuator

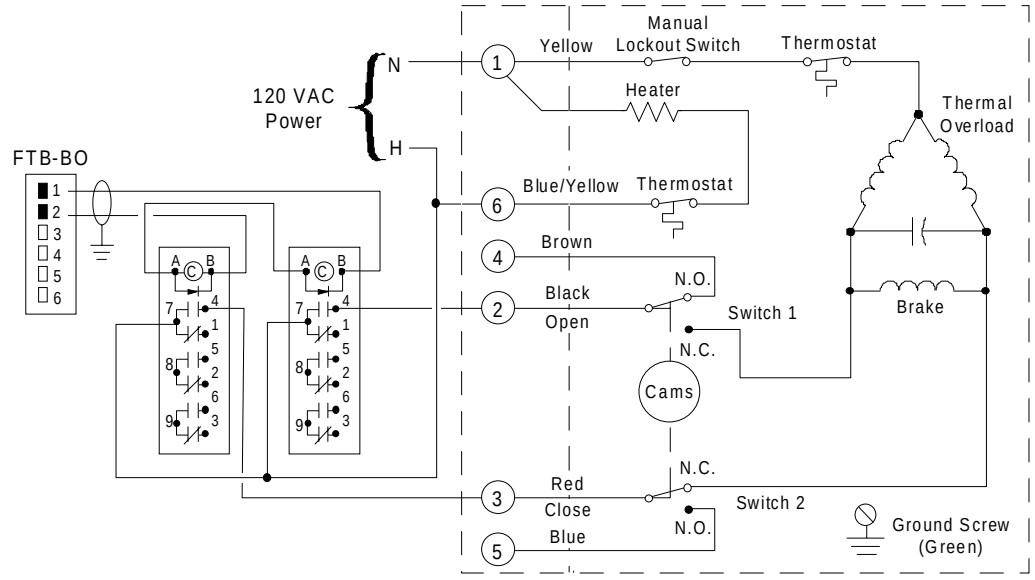


Figure 7: Typical Wiring Schematic for DSC-8500 Control of a VA-900x-02 Series Two-Position Electric Actuator

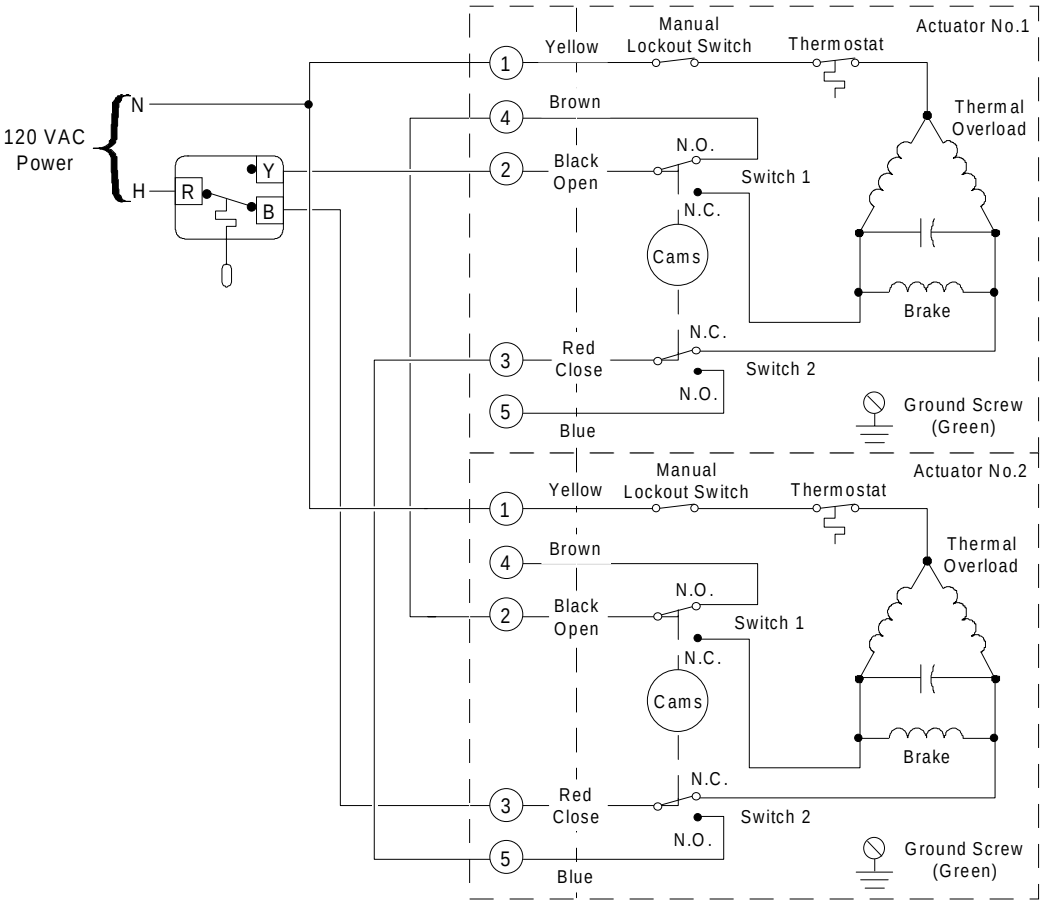


Figure 8: Typical Wiring Schematic for Sequential Control of Two VA-900x-02 Series Two-Position Electric Actuators

Table 2: Accessories and Repair Parts*

Description	Code Number
Servo Control Kits:	
4 to 20 mA for Discontinued VA-9001, VA-9002, VA-9003, VA-9004, VA-9005, and VA-9006 Series Modulating Electric Actuators	VA-9420-601
4 to 20 mA for Discontinued VA-9007 and VA-9008 Series Modulating Electric Actuators (Manufactured Prior to January, 1995)	VA-9420-601
4 to 20 mA for Current VA-9007 and VA-9008 Series Modulating Electric Actuators (Manufactured After January, 1995)	VA-9420-601
Mounting and Adaptor Kits (Two-Way Valves):	
Used when Mounting VA-9007 Series Electric Rotary Actuators on 16 in. VF Series Butterfly Valves	VA-9007-1600
Used when Mounting VA-9007 Series Electric Rotary Actuators on 18 and 20 in. VF Series Butterfly Valves	VA-9007-2000
Used when Mounting VA-9008 Series Electric Rotary Actuators on 16 in. VF Series Butterfly Valves	VA-9008-1600
Used when Mounting VA-9008 Series Electric Rotary Actuators on 18 and 20 in. VF Series Butterfly Valves	VA-9008-2000
Limit Switch Kit:	
For All Models of VA-9007 and VA-9008 Series Electric Rotary Actuators	VA-900X-601
Thermostat/Heater Kit:	
For All Models of VA-9007 and VA-9008 Series Electric Rotary Actuators	VA-900X-602
Feedback Potentiometer Kit:	
0 to 1000 Ohms, For All Models of VA-9007 and VA-9008 Series Electric Rotary Actuators	VA-900X-603

* For non-standard accessories and repair parts, contact your local Johnson Controls representative.

Specifications

Product		VA-9000 Series Electric Rotary Actuators
Models	**Two-Position**	VA-900x-02 Series (Refer to Figure 2.)
(Refer to Table 1.)	**Modulating**	VA-900x-01 Series (Refer to Figure 3.)
Dimensions		Refer to Figures 4 and 5.
Motor Ratings, Operating Speeds, and Output Torque Values		Refer to Table 1.
Supply Voltage		120 VAC, 50/60 Hz
Limit Switches		Two, Rated at 15 Amperes Each and Factory Set for 0 to 90° Travel (With LED Indication*)
Control Signal*		4 to 20 mA DC (Factory Set)
Feedback Potentiometer*		1000 Ohms
Input Impedance*		390 Ohms
Ambient Temperature Limits		-40 to 150°F (-40 to 66°C); Heater/Thermostat Kit Required Below 32°F (0°C)
Accessories and Repair Parts		Refer to Table 2.

* VA-900x-01 Series Modulating Actuators only.

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

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