

VA-9070 Series

# VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service

## Description

The VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service are designed for direct mounting on VF Series Butterfly Valves. The VA-9070 is available in eight different sizes, for two-position and modulating service on VF Series Standard-Pressure, Standard-Temperature Butterfly Valves and VF Series High-Pressure, High-Temperature Butterfly Valves.

Refer to the *VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service Product Bulletin (LIT-977319)* for important product application information.

## Features

- low profile and lightweight design
- built-in motor overload protection
- pre-wired actuator switches to terminal block; field-configurable power and input signals
- patented travel limit switch cam design
- external manual handwheel override
- rugged, die-cast aluminum National Electrical Manufacturers' Association (NEMA) 4, 4X, IP65 Type enclosure and captive housing screws
- valve status display

VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service Product Bulletin (LIT-977319) for a list of repair parts available.

## Selection Charts

### Code Numbers and Cross-Reference Data (Part 1 of 2)

Johnson Controls Actuator Only Code Number	Johnson Controls VF Series Butterfly Valve Assembly Actuator Sub-code	Bray Series Number
<b>Electric Two-Position Models</b>		
VA-9072-02	-722	S70-005 On-Off
VA-9073-02	-723	S70-008 On-Off
VA-9074-02	-724	S70-012 On-Off
VA-9075-02	-725	S70-020 On-Off
VA-9076-02	-726	S70-030 On-Off
VA-9077-02	-727	S70-050 On-Off
VA-9078-02	-728	S70-065 On-Off
VA-9072-12	-722D4	S70-005 On-Off, AC 24V
VA-9075-12	-725D4	S70-020 On-Off, AC 24V
VA-9077-12	-727D4	S70-050 On-Off, AC 24V
<b>Electric Modulating Models</b>		
VA-9072-01	-702	S70-005 Modulating
VA-9073-01	-703	S70-008 Modulating
VA-9074-01	-704	S70-012 Modulating
VA-9075-01	-705	S70-020 Modulating
VA-9076-01	-706	S70-030 Modulating
VA-9077-01	-707	S70-050 Modulating
VA-9078-01	-708	S70-065 Modulating
VA-9072-11	-702N4	S70-005 Modulating, AC 24V



VA-9070 Series Electric Rotary Actuator Mounted on a VF Series Butterfly Valve

- heater/thermostat

## Repair Information

If the VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service fails to operate within its specifications, refer to the

### Code Numbers and Cross-Reference Data (Part 2 of 2)

Johnson Controls Actuator Only Code Number	Johnson Controls VF Series Butterfly Valve Assembly Actuator Sub-code	Bray Series Number
VA-9075-11	-705N4	S70-020 Modulating, AC 24V
VA-9077-11	-707N4	S70-050 Modulating, AC 24V

### Actuator Selection for Two-Way Standard Performance VF Series Butterfly Valves

Valve Size (in.)	Torque Required lb-in (N·m)	Actuator Code Number for	
		Two-Position Service	Modulating Service
<b>150 or 175 psig (High) Closeoff Pressure<sup>1</sup></b>			
2	158 (17.9) <sup>2</sup>	VA-9072-02 or VA-9072-12	VA-9072-01 or VA-9072-11
2-1/2	188 (21.2) <sup>2</sup>		
3	225 (25.4) <sup>2</sup>		
4	465 (52.5) <sup>2</sup>		
5	585 (66.1) <sup>2</sup>	VA-9073-02 or VA-9075-12	VA-9073-01 or VA-9075-11
6	705 (79.7) <sup>2</sup>		
8	1,530 (172.9) <sup>2</sup>	VA-9075-02 or VA-9075-12	VA-9075-01 or VA-9075-11
10	3,296 (372.4) <sup>2</sup>		
12	5,165 (583.6) <sup>2</sup>	VA-9076-02 or VA-9077-12	VA-9076-01 or VA-9077-11
14	6,450 (728.8) <sup>2</sup>		
<b>50 psig (Low) Closeoff Pressure<sup>3</sup></b>			
4	225 (25.4) <sup>2</sup>	VA-9072-02 or VA-9072-12	VA-9072-01 or VA-9072-11
5	390 (44.1) <sup>2</sup>		
6	570 (64.4) <sup>2</sup>		
8	705 (79.7) <sup>2</sup>	VA-9073-02 or VA-9075-12	VA-9073-01 or VA-9075-11
10	1,410 (159.3) <sup>2</sup>		

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, Inc. shall not be liable for damages resulting from misapplication or misuse of its products. © 2009 Johnson Controls, Inc. [www.johnsoncontrols.com](http://www.johnsoncontrols.com)



## VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service

### Actuator Selection for Two-Way Standard Performance VF Series Butterfly Valves

Valve Size (in.)	Torque Required lb-in (N-m)	Actuator Code Number for	
		Two-Position Service	Modulating Service
12	2,595 (293.2) <sup>2</sup>	VA-9076-02 or VA-9077-12	VA-9076-01 or VA-9077-11
14	3,300 (372.9) <sup>2</sup>	VA-9077-02 or VA-9077-12	VA-9077-01 or VA-9077-11
16	4,268 (482.2) <sup>2</sup>	VA-9077-02 or VA-9077-12	VA-9077-01 or VA-9077-11
18	5,267 (595.1) <sup>2</sup>	VA-9078-02	VA-9078-01

- 150 psig (1,034 kPa) for 14 in. valves; 175 psig (1,207 kPa) for 2 through 12 in. valves.
- Torque values have already been adjusted for 25% safety factor on 2 through 12 in. valves, 10% safety factor on 14 in. valves.
- 50 psig (345 kPa) for 4 through 20 in. valves.

### Actuator Selection for Two-Way High Performance VF Series Butterfly Valves

Valve Size (in.)	Torque Required <sup>1</sup> lb-in (N-m)	Actuator Code Number for	
		Two-Position Service	Modulating Service
<b>550 psig Closeoff Pressure</b>			
2-1/2	510 (57.6)	VA-9073-02 or VA-9075-12	VA-9073-01 or VA-9075-11
3	530 (59.9)		
4	730 (82.5)		
5	1,850 (209)	VA-9075-02 or VA-9075-12	VA-9075-01 or VA-9075-11
6	2,300 (260)	VA-9076-02 or VA-9077-12	VA-9076-01 or VA-9077-11
8	4,300 (486)	VA-9077-02 or VA-9077-12	VA-9077-01 or VA-9077-11
<b>240 psig Closeoff Pressure</b>			
2-1/2	300 (33.9)	VA-9072-02 or VA-9075-12	VA-9072-01 or VA-9075-11
3	320 (36.2)		
4	460 (52.0)		
5	1,040 (118)	VA-9074-02 or VA-9075-12	VA-9074-01 or VA-9075-11
6	1,200 (136)	VA-9075-02 or VA-9075-12	VA-9075-01 or VA-9075-11
8	2,100 (237)	VA-9076-02 or VA-9077-12	VA-9076-01 or VA-9077-11
10	4,100 (463)	VA-9077-02 or VA-9077-12	VA-9077-01 or VA-9077-11
12	6,500 (734)	VA-9078-02	VA-9078-01

- Torque values include a safety factor.

### Actuator Selection for Three-Way Standard Performance VF Series Butterfly Valves

Valve Size (in.)	Torque Required lb-in (N-m)	Actuator Code Number for	
		Two-Position Service	Modulating Service
<b>175 psig (High) Closeoff Pressure<sup>1</sup></b>			
2	190 (21.5) <sup>2</sup>	VA-9072-02 or VA-9072-12	VA-9072-01 or VA-9072-11
2-1/2	225 (25.4) <sup>2</sup>		
3	270 (30.5) <sup>2</sup>		
4	558 (63.0) <sup>2</sup>	VA-9073-02 or VA-9075-12	VA-9073-01 or VA-9075-11
5	702 (79.3) <sup>2</sup>		
6	846 (95.6) <sup>2</sup>	VA-9074-02 or VA-9075-12	VA-9074-01 or VA-9075-11
8	1,836 (207.4) <sup>2</sup>	VA-9075-02 or VA-9075-12	VA-9075-01 or VA-9075-11
10	3,955 (446.9) <sup>2</sup>	VA-9077-02 or VA-9077-12	VA-9077-01 or VA-9077-11
12	6,198 (700.3) <sup>2</sup>	VA-9078-02	VA-9078-01
<b>50 psig (Low) Closeoff Pressure<sup>3</sup></b>			
4	270 (30.5) <sup>2</sup>	VA-9072-02 or VA-9072-12	VA-9072-01 or VA-9072-11
5	468 (52.9) <sup>2</sup>		
6	684 (77.3) <sup>2</sup>		
8	846 (95.6) <sup>2</sup>	VA-9074-02 or VA-9075-12	VA-9074-01 or VA-9075-11
10	1,692 (191.2) <sup>2</sup>	VA-9075-02 or VA-9075-12	VA-9075-01 or VA-9075-11
12	3,114 (351.8) <sup>2</sup>	VA-9077-02 or VA-9077-12	VA-9077-01 or VA-9077-11

- 175 psig (1,207 kPa) for 2 through 12 in. valves.
- Torque values have already been adjusted for 25% safety factor for all sizes.
- 50 psig (345 kPa) for 4 through 12 in. valves.



## VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service

### Accessories

Description		Code Number
<b>Servo Kit</b>	For All Models of VA-9070 Series Modulating Electric Actuators	VA-907X-630
<b>Thermostat/Heater Kit</b>	For All Models of VA-9070 Series Two-Position and Modulating Electric Actuators	VA-907X-609
<b>Mounting and Adaptor Kits for Standard-Pressure, Standard-Temperature Two-Way VF Series Butterfly Valves</b>	Mounts VA-9071 and VA-9072 Series Two-Position and Modulating Electric Actuators on 2 through 3 in. Valves	VA-9072-300
	Mounts VA-9071 and VA-9072 Series Two-Position and Modulating Electric Actuators on 4 in. Valves	VA-9072-400
	Mounts VA-9071 and VA-9072 Series Two-Position and Modulating Electric Actuators on 5 and 6 in. Valves	VA-9072-600
	Mounts VA-9073, VA-9074, and VA-9075 Series Two-Position and Modulating Electric Actuators on 4 in. Valves	VA-9075-400
	Mounts VA-9073, VA-9074, and VA-9075 Series Two-Position and Modulating Electric Actuators on 5 and 6 in. Valves	VA-9075-600
	Mounts VA-9073, VA-9074, and VA-9075 Series Two-Position and Modulating Electric Actuators on 8 in. Valves	VA-9075-800
	Mounts VA-9073, VA-9074, and VA-9075 Series Two-Position and Modulating Electric Actuators on 10 and 12 in. Valves	VA-9075-1200
	Mounts VA-9076, VA-9077, and VA-9078 Series Two-Position and Modulating Electric Actuators on 8 in. Valves	VA-9078-800
	Mounts VA-9076, VA-9077, and VA-9078 Series Two-Position and Modulating Electric Actuators on 10 and 12 in. Valves	VA-9078-1200
	Mounts VA-9076, VA-9077, and VA-9078 Series Two-Position and Modulating Electric Actuators on 14 and 16 in. Valves	VA-9078-1600
	Mounts VA-9076, VA-9077, and VA-9078 Series Two-Position and Modulating Electric Actuators on 18 and 20 in. Valves	VA-9078-2000
<b>Mounting and Adaptor Kits for Class 150 High-Pressure, High-Temperature Two-Way VF Series Butterfly Valves</b>	Mounts VA-9072 Series Electric Actuators on 2-1/2 through 4 in. Valves	VA-9072-410
	Mounts VA-9074 Series Electric Actuators on 5 in. and VA-9075 Series Electric Actuators on 6 in. Valves	VA-9075-610
	Mounts VA-9076 Series Electric Actuators on 8 in. Valves	VA-9078-810
	Mounts VA-9077 Series Electric Actuators on 10 in. and VA-9078 Series Electric Actuators on 12 in. Valves	VA-9078-1210
<b>Mounting and Adaptor Kits for Class 300 High-Pressure, High-Temperature Two-Way VF Series Butterfly Valves</b>	Mounts VA-9073 Series Electric Actuators on 2-1/2 through 4 in. Valves	VA-9075-430
	Mounts VA-9075 Series Electric Actuators on 5 in. Valves	VA-9075-530
	Mounts VA-9076 Series Electric Actuators on 6 in. Valves	VA-9075-630
	Mounts VA-9077 Series Electric Actuators on 8 in. Valves	VA-9075-830
<b>Local Control Station</b>	For All Models of VA-9070 Series Modulating Electric Actuators; Kit Includes Local and Remote Control Switch, Open-Stop-Close Switch, and Two LEDs for Position Indication (Green for Open and Red for Closed)	VA-907X-620
<b>Auxiliary Switch Kits</b>	Single Auxiliary Switch for VA-9073, VA-9074, and VA-9075 Series Modulating Electric Actuators	VA-907X-601
	Single Auxiliary Switch for VA-9076, VA-9077, and VA-9078 Series Modulating Electric Actuators	VA-907X-602
	Single Auxiliary Switch for VA-9073, VA-9074, and VA-9075 Series Two-Position Electric Actuators	VA-907X-603
	Single Auxiliary Switch for VA-9076, VA-9077, and VA-9078 Series Two-Position Electric Actuators	VA-907X-604
	Two Auxiliary Switches for VA-9073, VA-9074, and VA-9075 Series Two-Position Electric Actuators	VA-907X-605
	Two Auxiliary Switches for VA-9076, VA-9077, and VA-9078 Series Two-Position Electric Actuators	VA-907X-606
<b>Feedback Potentiometer Kits</b>	Feedback Potentiometer Kit, 5000 Ohm, Gear Driven for VA-907X Series Proportional Non-Spring Return Electric Actuators	VA-907X-615



## VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service

### Technical Specifications

VA-9070 Series Electric Rotary Actuators	
Dimensions	Refer to the <i>VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service Product Bulletin (LIT-977319)</i> .
Motor Ratings and Operating Speeds	See <i>VA-9070 Series Electric Rotary Actuators Motor Ratings and Operating Speeds</i> .
Output Torque Values, Rim Pull, and Mounting Data	See <i>VA-9070 Series Electric Rotary Actuators Output Torque Values, Rim Pull, and Mounting Data</i> .
Supply Voltage	120 VAC, 50/60 Hz or 24 VAC, 50/60 Hz
Limit Switches	Two SPDT (Single-Pole, Double-Throw) switches rated for 10 amperes (75 to 80% power factor), 1/2 hp 125 VAC, and 3/4 hp 250 VAC
Control Signal, Proportional Models	4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC, or 2 to 10 VDC, field-selectable
Ambient Temperature Limits	-40 to 150°F (-40 to 66°C); Heater/Thermostat Kit Required below 32°F (0°C)
Agency Listings	UL File number E200414; CSA reference LR 78858; CE compliant. All VA-9070 actuators are CSA approved under Class 3211 07 Industrial Control Equipment - Miscellaneous Apparatus. The CSA certificate number is LR78858-4 issued July 1996 to Bray Controls for the Series 70 actuators, NEMA 4, and NEMA 4X.

VA-9070 Series Electric Rotary Actuators Motor Ratings and Operating Speeds			
Actuator Series: Johnson Controls Code Number (Bray Series Number)	50/60 Hz Single Phase Motors: Current Rating in Amps at All Speeds		Two-Position and Modulating Speeds for 90° Operation in Seconds <sup>1</sup>  (Total Gear Ratio)
	VAC	Amperes	
VA-9072 (S70-005)	120	1.4	30 sec (5,070:1)
	24	1.0	
VA-9073 (S70-008)	120	2.1	30 sec (3,340:1)
VA-9074 (S70-012)			
VA-9075 (S70-020)	120	2.1	
	24	2.8	
VA-9076 (S70-030)	120	3.0	
VA-9077 (S70-050)	120	3.0	
	24	3.0	
VA-9078 (S70-065)	120	3.0	

1. The duty cycle for two-position and modulating operation is 100% at a maximum ambient temperature of 104°F (40°C).

VA-9070 Series Electric Rotary Actuators Output Torque Values, Rim Pull, and Mounting Data				
Actuator Series: Johnson Controls Code Number (Bray Series Number)	Output Torque lb-in (N-m)	Rim Pull lb (kg)	Valve Sizes for Direct Mount	Net Weight lb (kg)
VA-9072 (S70-005)	500 (57)	19.0 (8.6)	2 through 6 in.	12.0 (5.4)
VA-9073 (S70-008)	800 (90)	13.0 (5.9)		
VA-9074 (S70-012)	1,200 (136)	20.0 (9.1)	8 through 20 in.	48.0 (21.8)
VA-9075 (S70-020)	2,000 (226)	33.0 (15.0)		
VA-9076 (S70-030)	3,000 (339)	33.0 (15.0)		
VA-9077 (S70-050)	5,000 (565)	55.0 (25.0)		
VA-9078 (S70-065)	6,500 (734)	72.0 (32.7)		