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

Product Bulletin

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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 seven 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.

For more detailed information on VA-9070 Series Electric Rotary Actuators, refer to the VA-9070 Series Electric Rotary Actuators for Two-Position and Modulating Service Technical Bulletin (LIT-977325).


Figure 1: VA-9070 Series Electric Rotary Actuator Mounted on a VF Series Butterfly Valve

Table 1: Features and Benefits

| Features | Benefits |
| :--- | :--- |
| Low Profile and Lightweight Design | Reduces space requirements and provides ease of installation. |
| Built-in Motor Overload Protection for 120 VAC <br> Motors | Prevents thermal overload of motor. |
| Pre-wired Actuator Switches to Terminal Block; <br> Field-Configurable Power and Input Signals | Provide ease of wiring without interference from other components; <br> enable field modification of input signal. |
| Patented Travel Limit Switch Cam Design | Allows simple adjustment of travel limit cams without interference. |
| External Manual Handwheel Override | Ensures positive and fast manual operation without the need for extra <br> tools or levers. |
| Rugged, Die-Cast Aluminum NEMA 4, 4X, IP65 <br> Type Enclosure with Captive Housing Screws | Provide waterproofing and exceptional corrosion, wear, impact, and <br> Ultraviolet (UV) light resistance; prevents time-consuming problems <br> due to lost or misplaced bolts. |
| Valve Status Display | Provides clear and convenient indication of valve position throughout <br> full range of travel. |
| Heater/Thermostat | Prevents condensation build-up and freeze-ups. |

## Selection Table

Table 2: Code Numbers and Cross-Reference Data

| Johnson Controls® ${ }^{\circledR}$ Actuator Only Code Number | Johnson Controls VF Series Butterfly Valve Assembly Actuator Sub-code | Bray® Series Number |
| :---: | :---: | :---: |
| Electric Two-Position Models |  |  |
| VA-9072-02 | -722 | S70-006 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 | S70-006 On-Off, AC 24V |
| VA-9075-12 | -725D4 | S70-020 On-Off, AC 24V |
| VA-9077-12 | -727D4 | S70-050 On-Off, AC 24V |
| VA-907A-02 | -927 | S70-130 On-Off |
| VA-907B-02 | -928 | S70-180 On-Off |
| Electric Modulating Models |  |  |
| VA-9072-01 | -702 | S70-006 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 | S70-006 Modulating, AC 24V |
| VA-9075-11 | -705N4 | S70-020 Modulating, AC 24 V |
| VA-9077-11 | -707N4 | S70-050 Modulating, AC 24V |
| VA-907A-01 | -907 | S70-130 Modulating |
| VA-907B-01 | -908 | S70-180 Modulating |

## Applications

Figure 2 and Figure 3 show typical wiring diagrams for their respective applications.


Figure 2: Typical Wiring Diagram of VA-9070 Series Two-Position Electric Rotary Actuator

|  |  |  | Z |
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Figure 3: Typical Wiring Diagram of VA-9070 Series Modulating Electric Rotary Actuator

## Dimensions

Figure 4 and Table 3 provide dimensions for VA-9070 Series actuators. Table 4 and Table 5 provide further technical data.


Figure 4: VA-9070 Series Electric Rotary Actuator Dimensions, in. (mm) (See Table 3.)

Table 3: VA-9070 Series Electric Rotary Actuator Dimensions, in. (mm)

| Dimension | Actuator Series: Johnson Controls Code Number (Bray Series Number) |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | VA-9072 (S70-006) | VA-9075 (S70-020) | VA-9076 (S70-030) <br> VA-9077 (S70-050) <br> VA-9078 (S70-065) | VA-907A (S70-130) <br> VA-907B (S70-180) |
| A | $5-19 / 32(142)$ | $7-13 / 16(198)$ | $9-1 / 2(241)$ | $9-1 / 2(241)$ |
| B | $5-3 / 32(129)$ | $6-1 / 2(165)$ | $7-3 / 16(183)$ | $12-1 / 2(317)$ |
| C | $7-1 / 2(191)$ | $10-3 / 32(256)$ | $12-3 / 32(307)$ | $12-3 / 32(307)$ |
| D | $1-15 / 16(49)$ | $2-11 / 16(68)$ | $3-3 / 16(81)$ | $9-3 / 32(234)$ |
| E | $1 / 2$ NPTF | $3 / 4$ NPTF | $3 / 4$ NPTF | $3 / 4$ NPTF |
| F | $2(51)$ | $2-19 / 32(66)$ | $3-3 / 32(79)$ | $8-1 / 3(211)$ |
| G (UNC) | $5 / 16-18 \times 2-3 / 4$, F07 | $5 / 16-18 \times 2-3 / 4$, F07 | $1 / 2-13 \times 4-15 / 16$, F12 | $1 / 2-13($ F12) |
| H (UNC) | --- | $1 / 2-13 \times 4-29 / 32$, F12 | $3 / 4-10 \times 6-1 / 2$, F16 | $3 / 4-10($ F16) |
| J | $3 / 4(19)$ | $1-3 / 16(30)$ | See Detail A in Figure 4. | See Detail B in Figure 4. |
| K | $1 / 2(13)$ | $7 / 8(22)$ |  |  |
| L | $1-3 / 4(44)$ | $2-3 / 16(56)$ |  |  |

Table 4: VA-9070 Series Electric Rotary Actuators Motor Ratings and Operating Speeds

| $\begin{array}{l}\text { Actuator Series: } \\ \text { Johnson Controls } \\ \text { Code Number } \\ \text { (Bray Series } \\ \text { Number) }\end{array}$ | $\begin{array}{l}\text { 50/60 Hz Single Phase Motors: } \\ \text { Current Rating in Amperes } \\ \text { at All Speeds }\end{array}$ |  | $\begin{array}{l}\text { Two-Position and Modulating } \\ \text { Speeds for 90} \\ \text { Speration in }\end{array}$ |
| :--- | :--- | :--- | :--- |
| $\begin{array}{l}\text { Seconds }\end{array}$ |  |  |  |
| (Total Gear Ratio) |  |  |  |$\}$

1. The duty cycle for two-position and modulating operation is $100 \%$ at a maximum ambient temperature of $104^{\circ} \mathrm{F}\left(40^{\circ} \mathrm{C}\right)$.

Table 5: VA-9070 Series Electric Rotary Actuators Output Torque Values, Rim Pull, and Mounting Data (Part 1 of 2)

| Actuator Series: <br> Johnson Controls Code Number <br> (Bray Series Number) | Output Torque Ib•in (N•m) | Rim Pull Ib (kg) | Net Weight <br> lb (kg) |
| :--- | :--- | :--- | :--- |
| VA-9072 (S70-006) | $600(68)$ | $22.8(10.3)$ | $12.0(5.4)$ |
| VA-9075 (S70-020) | $2,000(226)$ | $33.0(15.0)$ | $28.0(12.7)$ |

$\begin{array}{ll}\text { Table 5: } & \text { VA-9070 Series Electric Rotary Actuators Output Torque Values, Rim Pull, and Mounting Data } \\ \text { (Part } 2 \text { of 2) }\end{array}$

| Actuator Series: <br> Johnson Controls Code Number <br> (Bray Series Number) | Output Torque Ib•in (N•m) | Rim Pull Ib (kg) | Net Weight <br> Ib (kg) |
| :--- | :--- | :--- | :--- |
| VA-9076 (S70-030) | $3,000(339)$ | $33.0(15.0)$ | $48.0(21.8)$ |
| VA-9077 (S70-050) | $5,000(565)$ | $55.0(25.0)$ |  |
| VA-9078 (S70-065) | $6,500(734)$ | $72.0(32.7)$ |  |
| VA-907A (S70-130) | $13,000(1,470)$ | $80.0(36.2)$ | $118.0(53.5)$ |
| VA-907B (S70-180) | $18,000(2,030)$ |  |  |

Table 6: Accessories (Part 1 of 2)

| Description |  | Code Number |
| :---: | :---: | :---: |
| Servo Kit | For All Models of VA-9070 Series Modulating Electric Actuators | VA-907x-630 |
| Thermostat/Heater Kit | For All Models of VA-9070 Series Two-Position and Modulating Electric Actuators | VA-907x-609 |
| Mounting and Adaptor Kits for Standard-Pressure, Standard-Temperature Two-Way VF Series Butterfly Valves | Mounts VA-9072 Series Two-Position and Modulating Electric Actuators on 2 through 3 in. Valves | VA-9072-300 |
|  | Mounts VA-9072 Series Two-Position and Modulating Electric Actuators on 4 in. Valves | VA-9072-400 |
|  | Mounts VA-9072 Series Two-Position and Modulating Electric Actuators on 5 and 6 in. Valves | VA-9072-600 |
|  | Mounts VA-9075 Series Two-Position and Modulating Electric Actuators on 4 in. Valves | VA-9075-400 |
|  | Mounts VA-9075 Series Two-Position and Modulating Electric Actuators on 5 and 6 in. Valves | VA-9075-600 |
|  | Mounts VA-9075 Series Two-Position and Modulating Electric Actuators on 8 in. Valves | VA-9075-800 |
|  | Mounts 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 Mounts VA-907A Series Two-Position and Modulating Electric Actuators on 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 Mounts VA-907A Series Two-Position and Modulating Electric Actuators on 18 in. Valves <br> Mounts VA-907B Series Two-Position and Modulating Electric Actuators on 20 in . Valves | VA-9078-2000 |

Table 6: Accessories (Part 2 of 2)

| Description |  | Code Number |
| :---: | :---: | :---: |
| Mounting and Adaptor Kits for Class 150 <br> High-Pressure, High-Temperature Two-Way VF Series Butterfly Valves | Mounts VA-9072 Series Electric Actuators on 2-1/2 through 4 in. Valves | VA-9072-410 |
|  | Mounts VA-9075 Series Electric Actuators on 5 in. and 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 |
|  | Mounts VA-907A Series Electric Actuators on 14 in. Valves | VA-9078-1600 |
|  | Mounts VA-907A Series Electric Actuators on 16 in. Valves | VA-9078-2000 |
| Mounting and Adaptor Kits for Class 300 High-Pressure, High-Temperature Two-Way VF Series Butterfly Valves | Mounts VA-9075 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 |
|  | Mounts VA-907A Series Electric Actuators on 12 in. Valves | VA-9078-1600 |
|  | Mounts VA-907B Series Electric Actuators on 14 in. Valves | VA-9078-2000 |
| Local Control Station | 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 |
| Auxiliary Switch Kits | Single Auxiliary Switch for 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-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-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 |
| Feedback Potentiometer Kits | Feedback Potentiometer Kit, 5,000 Ohm, Gear Driven for VA-907x Series Proportional Non-Spring Return Electric Actuators | VA-907X-615 |

## Technical Specifications

## VA-9070 Series Electric Rotary Actuators

| Code Numbers and Cross-Reference Data | Two-Position: VA-907x-02 Series (See Table 2.) Modulating: VA-907x-01 Series (See Table 2.) |
| :---: | :---: |
| Dimensions | See Table 3. |
| Motor Ratings and Operating Speeds | See Table 4. |
| Output Torque Values, Rim Pull, and Mounting Data | See Table 5. |
| Supply Voltage | 120 VAC, $50 / 60 \mathrm{~Hz}$ or 24 VAC $50 / 60 \mathrm{~Hz}$ |
| Limit Switches | Two SPDT (Single-Pole, Double-Throw) switches rated for 10 amperes ( 75 to 80\% power factor), $1 / 2 \mathrm{hp} 125$ VAC and $3 / 4 \mathrm{hp} 250$ VAC |
| Control Signal, Proportional Models | 4 to $20 \mathrm{~mA}, 0$ to 5 VDC, 0 to 10 VDC, or 2 to 10 VDC, field-selectable |
| Ambient Temperature Limits | -40 to $150^{\circ} \mathrm{F}\left(-40\right.$ to $\left.66^{\circ} \mathrm{C}\right)$; Heater/Thermostat Kit Required below $32^{\circ} \mathrm{F}\left(0^{\circ} \mathrm{C}\right)$ |
| Agency Listings | Models for 120 VAC Voltage (VA-907x-0x): <br> UL File number E200414; CSA reference LR 78858 <br> All VA-9070 actuators are CSA approved under Class 321107 Industrial Control <br> Equipment - Miscellaneous Apparatus. The CSA certificate number is LR78858-4 issued July <br> 1996 to Bray Controls for the Series 70 actuators, NEMA 4, and NEMA 4X. |
| Accessories and Repair Parts | See Table 6. |

The performance specifications are nominal and conform to acceptable industry standard. 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.

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