



**Applications:**



The ARA 600 series of motor actuators replaces the Series 60 of 24V motor actuators mounted to ESBE 3 way and 4 way rotary valves. Incorporated into the redesign of the ARA motor actuators are improvements in the mounting and operation of the motor actuator resulting in a simpler and quicker installation.

These redesigned direct mounted motor actuators are capable of mounting to the new VRG styles of 3 & 4-way rotary valves. In addition, the ARA 600 series are also backward compatible to the older MG and G series of valves.

The ARA 600 series is available in floating 3-point with or without an auxiliary switch and proportional, which cross over to the Series 60 actuators. However there are additional varieties of actuators to select from a 2-point actuator to different run time options. These variety of selections provide flexibility in application selecting.

**Features:**

- Fewer parts and tools required for installation
- Increased stabilization between actuator and valve
- Backward compatible with MG and G series of 3 & 4-way rotary valves
- Reduced profile and size of motor actuator
- Easier mounting procedure

**Ordering Information:**

**3-Point Floating Signal, 24VAC**

Code No.	Series	Signal	Run Time (90° @ 60Hz)	Replaces	
				Code No.	Series
193B1600	ARA663	Floating 3-point	96	082F8972	62E
193B1601	ARA644	Floating 3-point, w/ Aux. switch	24	-	-
193B1602	ARA654		48	-	-
183B1603	ARA664		96	082F8974	62EM

**Ordering Information  
(Cont.):**

**2-Point Signal, 24VAC**

Code No.	Series	Signal	Run Time (90° @ 60Hz)	Replaces	
				Code No.	Series
193B1604	ARA638	On/Off w/ Aux. switch	12	-	-
193B1605	ARA648		24	-	-

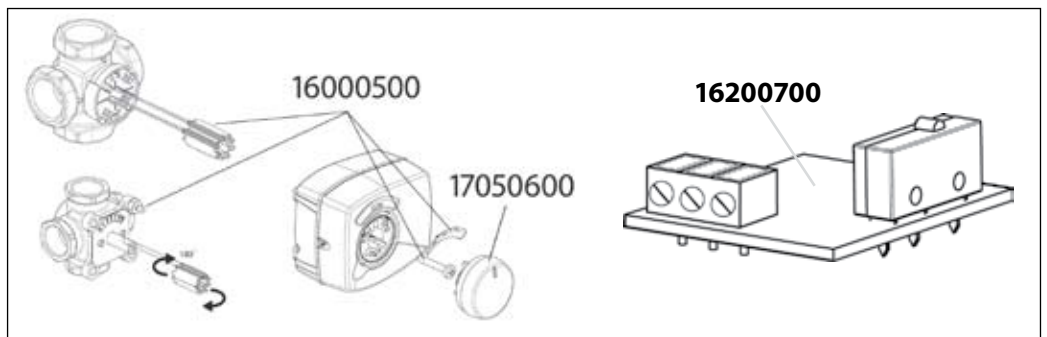
**Propotional Signal, 24V AC/DC**

Code No.	Series	Signal	Run Time (90° @ 60Hz)	Replaces	
				Code No.	Series
193B1606	ARA639*	0-10VDC, 2-10VDC, 0-20mA, 4-20mA with feedback ability	15/30/60/120	-	-
193B1607	ARA659	0-10VDC, 2-10VDC, 0-20mA, 4-20mA	45/120	082F8973	62P

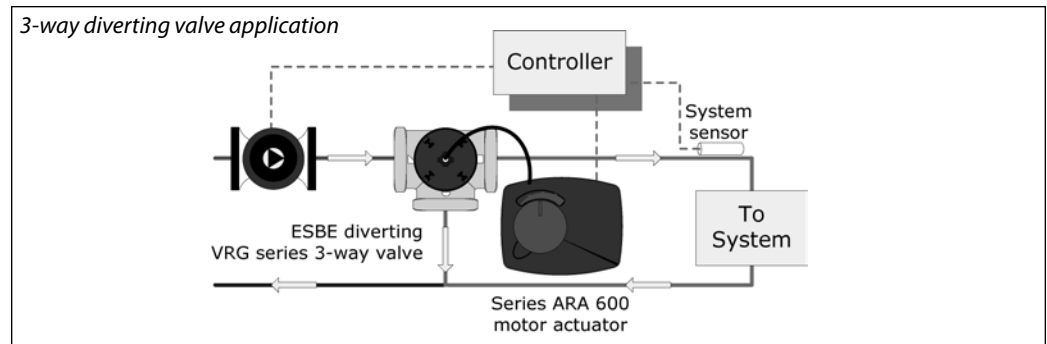
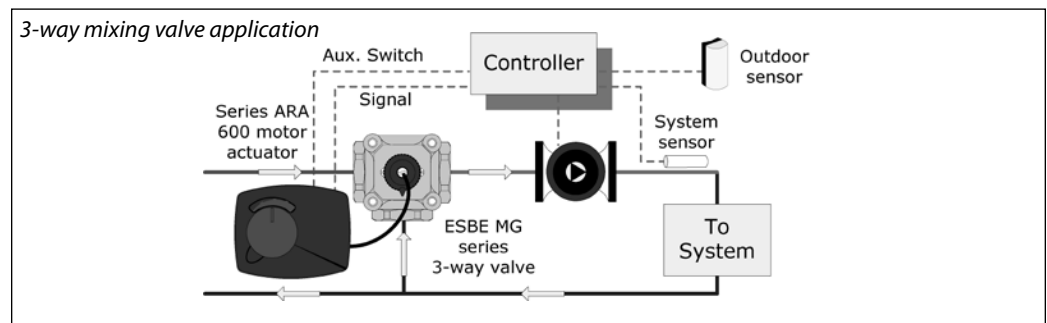
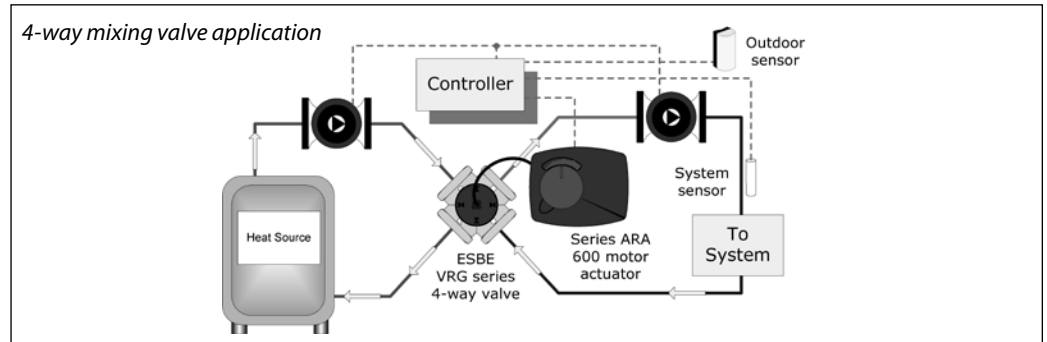
\*Wire lead not connected

**Accessories & Replacement Parts**

Code No.	Description
16000500	Assembly kit: drive sleeve, mounting stud scale and mounting screw
17050600	ARA motor actuator knob
16200700	Auxiliary end switch kit, includes end switch, cable and wiring plate cover



**Applications:**



**3 & 4 Way VRG Valves:**

3-Way Valve, Series 131		
Code No.	Connection	Cv <sup>1</sup>
193B1500	½" NPT	2.9
193B1501	¾" NPT	4.7
193B1502	¾" NPT	7.3
193B1503	1" NPT	7.3
193B1504	1" NPT	11.7
193B1505	1-¼" NPT	18.7
193B1506	1-½" NPT	29.3
193B1507	2" NPT	46.8

4-Way Valve, Series 141		
Code No.	Connection	Cv <sup>1</sup>
193B1531	¾" NPT	4.7
193B1532	¾" NPT	7.3
193B1533	1" NPT	11.7
193B1534	1-¼" NPT	18.7
193B1535	1-½" NPT	29.3
193B1536	2" NPT	46.8
193B1537	¾" Solder	2.9
193B1538	1" Solder	7.3
193B1539	1-¼" Solder	13.9

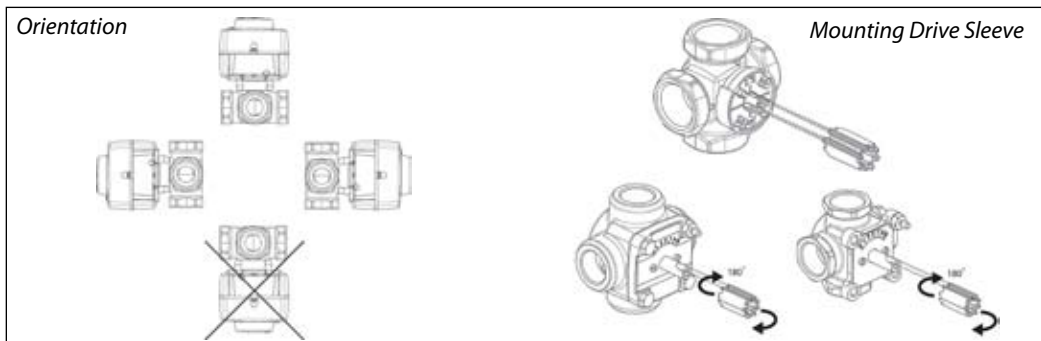
<sup>1</sup>Cv value based on flow per a 1 psi pressure drop through the valve

**Technical Specifications:**

	<b>3- Point</b>	<b>2- Point</b>	<b>Proportional</b>			
<b>ARA Series</b>	663 / 644 / 654 / 664	638 / 648	639 / 659			
<b>Supply Voltage</b>	24VAC +/- 10%, 50/60Hz	24VAC/DC +/- 10%, 50/60Hz	24VAC/DC +/- 10%, 50/60Hz			
<b>Power Consumption</b>	2VA			639	659	
			AC	11VA	8VA	
			DC	6VA	4VA	
<b>Rotation</b>	90°					
<b>Torque</b>	53.1 lbf.in (6Nm)	638	26.6 lbf.in (3Nm)	53.1 lbf.in (6 Nm)		
		648	53.1 lbf.in (6Nm)			
<b>Mountable Valve Size</b>	1/2" to 2" ESBE rotary mixing valves, Series MG, G and VRG (for 638 mountable on sizes 1/2" to 1-1/4")					
<b>Enclosure</b>	NEMA 1, IP 41					
<b>Ambient Temp. Range</b>	23 to 131°F (-5 to 55°C)					
<b>Weight</b>	1 lb (0.4 kg)					
<b>Run Time (sec)</b>	663	96 sec	638	12 sec	@ 60 Hz	
	644	24 sec			639	15/30/60/120
	654	48 sec	648	24 sec	659	45/120
	664	96 sec				
<b>Control Signal</b>	-			0-10V, 2-10V, 0-20mA, 4-20mA/ 60, 60 or 120 sec.		
<b>Output signal</b>	-			Proportional analogue signal (only for ARA369)		
<b>Auxiliary Switch</b>	Max 2A, adjustable cam position (663 actuator does not have Aux. switch)			Optional		

**Mounting & Installation:**

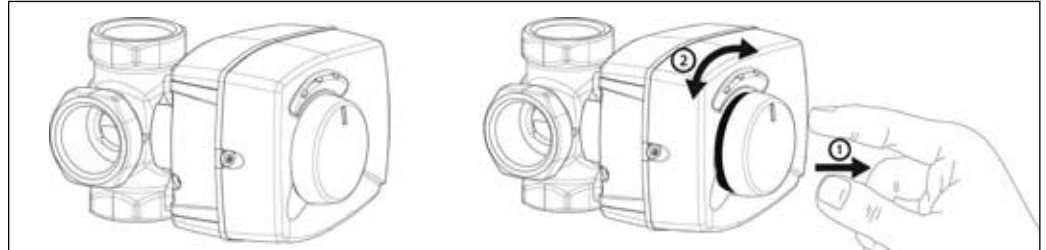
The actuator should be mounted with the ESBE rotary valve stem in either a horizontal position or pointing upwards. The actuator should not be installed in a downward orientation to reduce the possible contact of water with the actuator. Included with the actuator is the mounting hardware necessary to mount the electric motor actuator to an ESBE rotary mixing valves; MG, G, and VRG series.



With the white drive sleeve the ARA actuator can be installed on older MG and G series of valves and also current VRG valves. The orientation of the drive sleeve determines the style of valve the actuator will mount to.

**Manual Operation:**

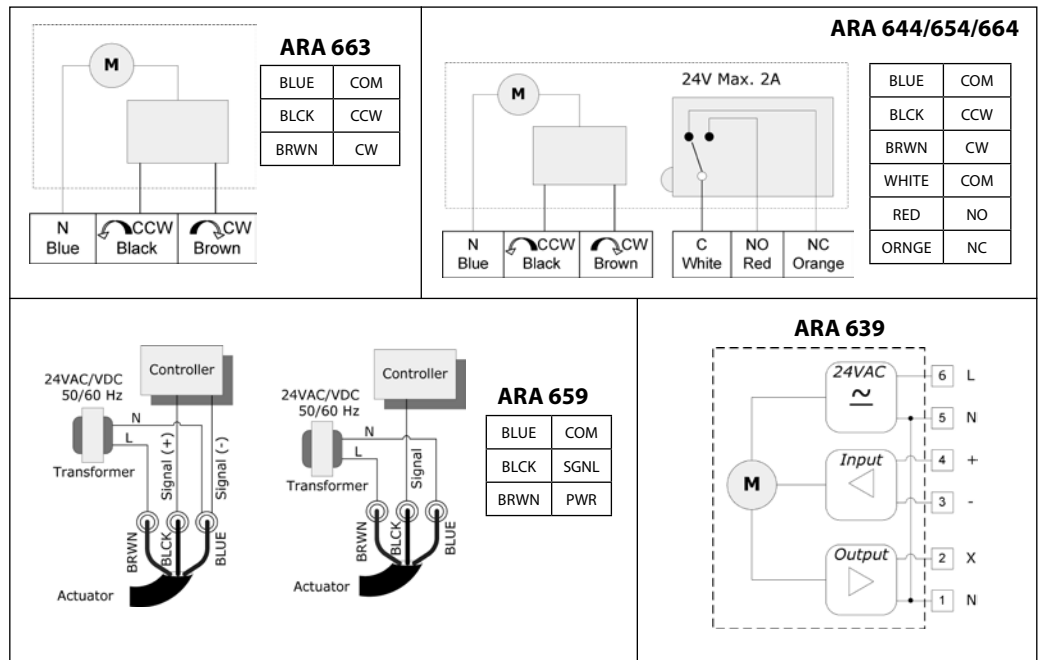
When placing the actuator in manual operation power should be turned off to the actuator. In the event the actuator is powered and is left in a manual position, the result could lead to the internal damage of the actuator.



To manually operate the ARA Series actuator, slightly pull out on the large indicator knob. With it pulled out, rotate the knob to the left or right to manually operate the valve. To return the actuator to automatic operation, rotate the knob to the position prior to manual operation and push the knob into the actuator.

**Electrical Wiring**

ARA600 Series Actuators:



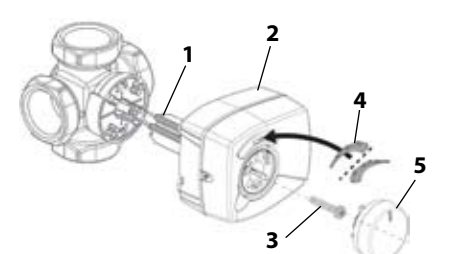
**Proportional Settings:**

**Dip switch setting for ARA639**

**Dip switch setting for ARA659**

*Switch descriptions*  
 1&2) Rotation time  
 3&4) Proportional signal  
 5) N/A  
 6) Motor actuator rotation  
 7) Activated filter (ON) reduces signal interferences reducing actuator hunting  
 8) During power outage, ARA639 remembers last position and does not require calibration cycle

**Internal Components:**



1.	Mount sleeve to valve
2.	Slide actuator onto valve
3.	Secure actuator with mounting screw
4.	Apply indicator, based on rotation
5.	Push knob onto actuator

**Dimensions:  
in (mm)**

Danfoss can accept no responsibility for possible errors in printed materials and reserves the right to alter its products without notice. All trademarks in this material are property of the respective companies. Danfoss and Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.



**Danfoss**  
 Toronto, ON  
 Toll Free: 866-375-HVAC (4822)  
 Tel.: 905-285-2050, Fax: 905-285-2055  
[www.na.heating.danfoss.com](http://www.na.heating.danfoss.com)

**Danfoss**  
 Baltimore, MD  
 Toll Free: 866-375-HVAC (4822)  
 Tel.: 443-512-0266, Fax: 443-512-0270  
[www.na.heating.danfoss.com](http://www.na.heating.danfoss.com)