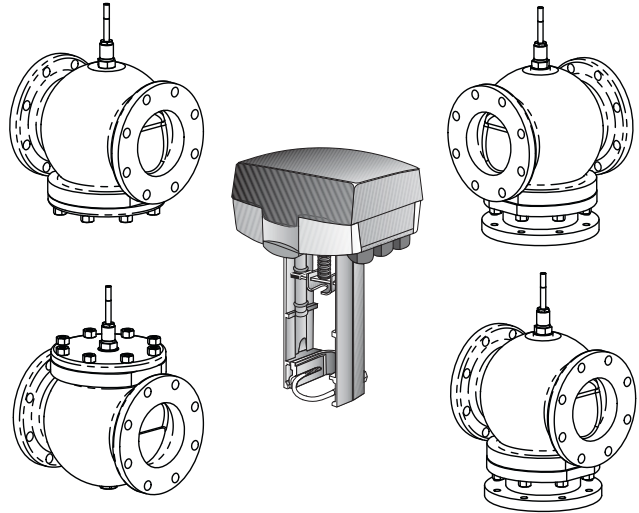


# VB-8000, VB-9313 Series

2½ to 6” Globe Valves and NSR Forta M800A and M1500A Actuators



## Applications

Schneider Electric Forta NSR M800A, and M1500A series linear actuators mount directly onto 2-1/2” to 6” VB-8xxx series and VB-9313 series two-way and three-way globe flanged valve bodies. Applications include chilled or hot water and steam. Field selectable input signals include reverse and direct acting, floating or proportional 0-10 Vdc, 2-10 Vdc or 4-20 mA, and proportional sequencing input signal ranges.

## Applicable Literature

- Schneider Electric Forta M400A and M800A and M1500A, F-27599
- AV-822 Installation Instructions, F-27443
- Schneider Electric Globe Valve Catalog, F-27855
- CA-28 Control Valve Sizing, F-13755

## Selection Guide Contents

Applications .....	page 1
Valve and Actuator Selection Procedure .....	page 1
Schneider Electric VB-8000 Series Valve Bodies. . .	page 2
Schneider Electric VB-9000 Series Valve Bodies. . .	page 3
Schneider Electric NSR Forta Actuator Model Chart	page 3
Valve/Actuator Close-off Pressures .....	page 4
Factory Valve and Actuator Assemblies .....	page 4
VB-8xxx and VB-9313 Valve Body Action .....	page 4
NSR Forta Actuator and Valve Body Dimensions . .	page 5
VB-8xxx Dimensions. ....	page 6
VB-9313 Dimensions .....	Page 6

## Valve and Actuator Selection Procedure

- 1. Determine the required flow coefficient (Cv/kvs).**  
Using the required flow and pressure drop for the application, determine the required flow coefficient (consult CA28, F-13755 if necessary).

### 2. Determine valve body part number.

Select a flanged VB-8xxx valve body from Table-1 or a flanged VB-9313 valve body from Table-2 having the required flow coefficient, size, body pattern, end connection, and temperature/pressure ratings appropriate for the application.

### 3. Select the Forta Actuator

Using the required close-off pressure for the application, consult Table-5 and select a Forta actuator having sufficient close-off pressure on the valve body selected in step 2. For valve/actuator combinations using VB-8xxx valve bodies, also consult Table-5 for maximum operating pressure differential limitations. Additional Forta actuator specifications may be found in Table-3 or in the Forta Installation Instructions sheets shown in *Applicable Literature*.

If necessary, use the dimensional information in Figure-1, Figure-2, Table-8, and Table-9 to confirm that the valve-actuator assembly will fit in the available space.

### 4. Determine Assembly Part Number

If a complete factory valve and actuator assembly is required, consult Table-3 for the actuator code of the Forta actuator selected in Step 3. For the complete assembly part number:

- Change the valve body part number prefix from VB to VU.
- Insert the actuator code in the third field of the part number.
- Confirm the factory assembly is available in Table-6

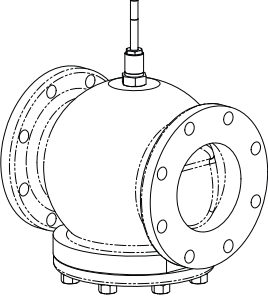
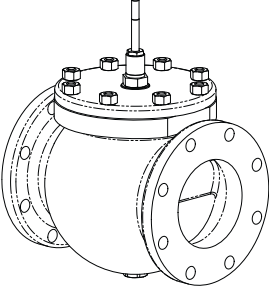
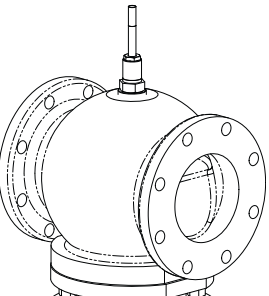
Example:

- Valve body: VB-8213-0-4-14
- Actuator: M1500A (actuator code 686 from Table-3)
- Complete assembly: VU-8213-686-4-14

Forta actuators are field configured for the desired control signal type and range plus the desired action. Consult the appropriate Forta Installation Instructions for further information (see *Applicable Literature*).

### Valve Body and Actuator Selection

**Table-1 Schneider Electric VB-8213, VB-8223, and VB-8303 Valve Bodies**

		Application			
		Chilled or Hot Water, Steam		Chilled or Hot Water	
		Two-Way Flanged		Three-Way Flanged	
<p><b>Two-Way and Three-Way Valves</b></p> <ul style="list-style-type: none"> <li>• Two-way Stem Up Open or Stem Up Closed</li> <li>• Three-way Mixing/Diverting</li> <li>• ASA 125 Flanged</li> <li>• Cast Iron Body</li> </ul>					
		<b>Size</b>	2-1/2" to 6"	2-1/2" to 6"	2-1/2" to 6"
		<b>Valve Body Part Number</b>	<b>VB-8213-0-5-P</b>	<b>VB-8223-0-5-P</b>	<b>VB-8303-0-5-P</b>
		<b>Valve Body Action</b>	2-Way Stem Open	2-Way Stem Up Closed	3-Way Mixing/Diverting <sup>a</sup>
		<b>Linkage Kit Part Number</b>	AV-822 <sup>b</sup>		
		<b>Material</b>	<b>Flow Type</b>	Equal %	Equal %
<b>Body</b>	Cast Iron		Cast Iron	Cast Iron	
<b>Seat</b>	Forged Brass		Forged Brass	Forged Brass	
<b>Stem</b>	Stainless Steel		Stainless Steel	Stainless Steel	
<b>Plug</b>	Forged Brass		Forged Brass	Forged Brass	
<b>Packing</b>	Spring Loaded TFE/EPDM		Spring Loaded TFE/EPDM	Spring Loaded TFE/EPDM	
	<b>Seat Ring</b>	EPDM	EPDM	None	
<b>ANSI Pressure Class, psig</b>		125 (up to 200 psig below 150°F)			
<b>Maximum Inlet Pressure Steam psig (kPa)</b>		35 psig (241 kPa)		—	
<b>Allowable Control Media Temperature, °F (°C)<sup>c</sup></b>		20°F to 281°F (-7°C to 138°C)			
<b>Close-Off Pressure, psi (kPa)</b>		125 psi (856 kPa) <sup>d</sup>		35 psi (241 kPa) <sup>d</sup>	
<b>P Code</b>	<b>Valve Size, In.</b>	$C_v (k_{vs})$		$C_v (k_{vs})$ Mixing <sup>e</sup>	$C_v (k_{vs})$ Diverting <sup>f</sup>
<b>12</b>	<b>2-1/2</b>	56 (48)	56 (48)	80 (69)	95 (82) <sup>g</sup> 115 (99) <sup>h</sup>
<b>13</b>	<b>3</b>	85 (74)	85 (74)	110 (95)	120 (104) <sup>i</sup>
<b>14</b>	<b>4</b>	145 (125)	145 (125)	190 (164)	190 (164) <sup>i</sup>
<b>15</b>	<b>5</b>	240 (208)	240 (208)	290 (251)	290 (251) <sup>i</sup>
<b>16</b>	<b>6</b>	370 (320)	370 (320)	500 (433)	500 (433) <sup>i</sup>

<sup>a</sup> VB-8303 valves may be used as either mixing or diverting valves. VB-8303 valves will also operate satisfactorily as two-way angle valves if either end (side) port is closed off.

<sup>b</sup> AV-822 linkage Kit included when valve/actuator are ordered as a factory assembly. Purchase separately for field assembly.

<sup>c</sup> CAUTION: Freeze protection required for temperatures below 32°F (0 °C). Avoid ice formation on stems.

<sup>d</sup> Valve in closed position. See Table-5 for maximum allowable VB-8xxx differential pressure for valve in any open position.

<sup>e</sup> Mixing configuration, ports A and B are inlets, port AB is outlet. Port AB located on bottom.

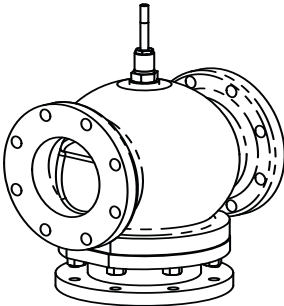
<sup>f</sup> Diverting configuration, port AB is inlet, ports A and B are outlets. Port AB located on bottom.

<sup>g</sup> Diverting configuration, flow AB to A ports.

<sup>h</sup> Diverting configuration, flow AB to B ports.

<sup>i</sup> All diverting flow configurations, flow AB to either A or B ports.

**Table-2 Schneider Electric VB-9313 Valve Bodies**

<p style="text-align: center;"><b>Three-Way Valves</b></p> <ul style="list-style-type: none"> <li>• Three-way mixing</li> <li>• ANSI 125 Flanged</li> <li>• Cast Iron Body</li> </ul>		<p><b>Application</b></p> <p>Chilled or Hot Water</p>	
			
		ASA Flanged	
<b>Size</b>		2-1/2" to 6"	
<b>Valve Body Part Number</b>		<b>VB-9313-0-5-P</b>	
<b>Linkage Kit Part Number</b>		AV-822	
<b>Material</b>	<b>Flow Type</b>	Mixing <sup>a</sup>	
	<b>Body</b>	Cast Iron	
	<b>Seat</b>	Bronze	
	<b>Stem</b>	Stainless Steel	
	<b>Plug</b>	Brass	
	<b>Packing</b>	Spring Loaded TFE/EPDM	
	<b>Disc</b>	None	
<b>ANSI Pressure Class, psig</b>		125	
<b>Allowable Control Media Temperature, °F ( °C)<sup>b</sup></b>		40°F to 300°F (4°C to 149°C)	
<b>Allowable Differential Pressure, Water, psi (kPa) <sup>c</sup></b>		35 psi (241 kPa) Max.	
<b>P Code</b>	<b>Valve Size, In.</b>	<b>C<sub>v</sub> (k<sub>vs</sub>) Rating</b>	
<b>12</b>	<b>2-1/2</b>	74 (64)	
<b>13</b>	<b>3</b>	101 (87)	
<b>14</b>	<b>4</b>	170 (147)	
<b>15</b>	<b>5</b>	290 (251)	
<b>15</b>	<b>6</b>	390 (337)	

<sup>a</sup> AV-822 linkage Kit included when valve/actuator are ordered as a factory assembly. Purchase separately for field assembly.  
<sup>b</sup> CAUTION: Freeze protection required for temperatures below 32°F (0 °C). Avoid ice formation on stems.  
<sup>c</sup> Maximum recommended differential in full open position. Do not exceed recommended differential pressure (pressure drop) or integrity of parts may be affected. Exceeding maximum recommended differential pressure voids product warranty.

**Table-3 Schneider Electric NSR Forta Actuator Model Chart**

Model	Actuator Code	Force, lbf (N)	Power	Running VA	Transformer Sizing VA	Floating Control <sup>a</sup>	Proportional Control <sup>a</sup>	Feedback	(2) SPDT Auxiliary Switches	Linkage
M800A	680	180 (800)	24 Vac ±10% 50/60 Hz, or 20 to 29 Vdc	15	50 <sup>c</sup>	Yes	0-10 Vdc, 2-10 Vdc, or 4-20 mAdc with 500 ohm resistor	2-10 Vdc	No	AV-822 (purchase separately)
M800A-S2	___ <sup>b</sup>								24 Vac 4A res.	
M1500A	686	337 (1500)	24	50 <sup>c</sup>	No					
M1500A-S2	___ <sup>b</sup>				24 Vac 4A res.					

<sup>a</sup> DIP switch selectable.  
<sup>b</sup> No actuator code. No factory assemblies offered.  
<sup>c</sup> M800 DC Power 20W, M1500 DC Power 30W.

**Table-5 Select Valve/Actuator Combination Having Sufficient Close-off for Application**

Valve Body	P Code	Size	Close-off Ratings, psi (kPa)		Maximum Operating Pressure Differential, psi (kPa)
			M800A M800A-S2 <sup>a</sup>	M1500A M1500A-S2 <sup>a</sup>	M1500A M1500A-S2 <sup>a</sup>
VB-8213-0-5-P VB-8223-0-5-P	-12, -13, -14, -15, -16	2-1/2" to 6"	Do Not Use <sup>b</sup>	125 (856)	35 (241) <sup>c</sup>
VB-8303-0-5-P				35 (241)	
VB-9313-0-5-P	-12	2-1/2"	29 (199)	61 (418)	<b>Note:</b> Do not use M400A or M400A-S2 actuators on 2-1/2" to 6" VB-8xxx or VB-9313 valve bodies.
	-13	3"	19 (130)	42 (288)	
	-14	4"	10 (68)	22 (151)	
	-15	5"	—	14 (96)	
	-16	6"	—	9 (62)	

<sup>a</sup> AV-821 linkage adapter kit required for mounting (order separately).

<sup>b</sup> M800A and M800A-S2 actuators are **not** compatible with VB-8xxx valve bodies.

<sup>c</sup> Maximum differential in any open position. For proper VB-8xxx valve operation, do **not** exceed Maximum Operating Pressure Differential.

## Factory Assemblies

**Table-6 Factory Valve and Actuator Assemblies**

VB-8000 Series Valve Assembly Part Number	P Code <sup>a</sup>	Size	Actuator Model (Actuator Code <sup>b</sup> )	VB-9313 Series Valve Assembly Part Number	P Code	Size	Actuator Model (Actuator Code <sup>b</sup> )	
			M1500A (686)				M800A (680)	M1500A (686)
VU-8213-686-5-P VU-8303-686-5-P	12	2-1/2"	X	VU-9313-xxx-5-P	12	2-1/2"	X	X
	13	3"	X		13	3"	X	X
	14	4"	X		14	4"	X	X
	15	5"	X		15	5"	—	X
	16	6"	X		16	6"	—	X

<sup>a</sup> Insert P code in last field of assembly part number.

<sup>b</sup> Insert actuator code in third field of assembly part number.

**Table-7 VB-8xxx and VB-9313 Valve Body Action**

Valve Body/ Valve Assembly	Valve Body Description	Stem Up Position	Action (As actuator strokes and valve stem goes down)
VB-8213-0-5-P VU-8213-xxx-5-P	Two-Way Stem up open	Valve open	A to AB flow decreases
VB-8223-0-5-P	Two-way stem up closed	Valve closed	A to AB flow increases
VB-8303-0-5-P VU-8303-xxx-5-P	Three-way mixing	Flow B to AB	B to AB flow decreases A to AB flow increases (common port bottom)
	Three-way diverting	Flow AB to B	AB to B flow decreases AB to A flow increases (common port bottom)
VB-9313-0-5-P VU-9313-xxx-5-P	Three-way mixing	Flow B to AB	B to AB flow decreases A to AB flow increases (common port side)

## Dimensions

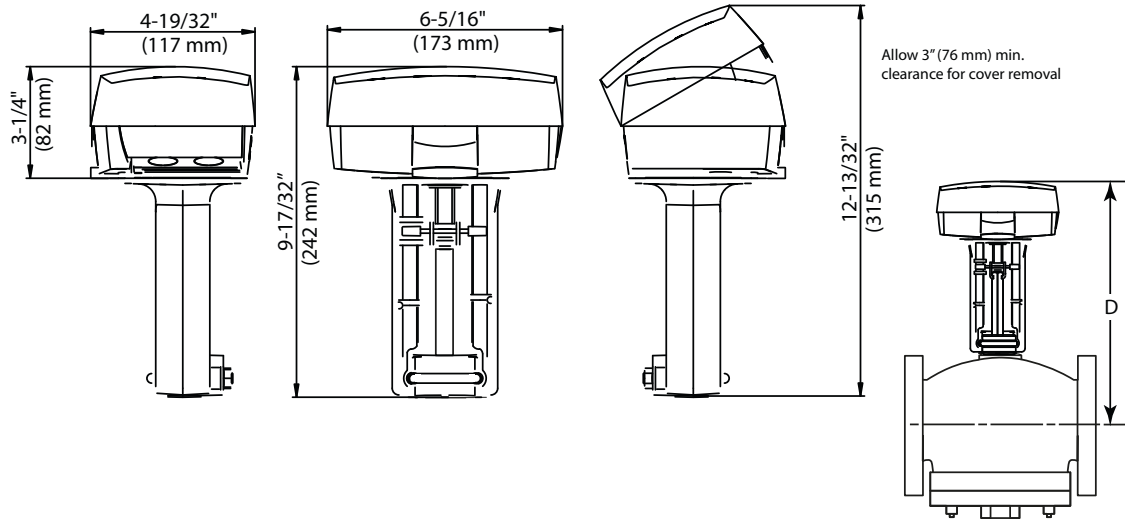
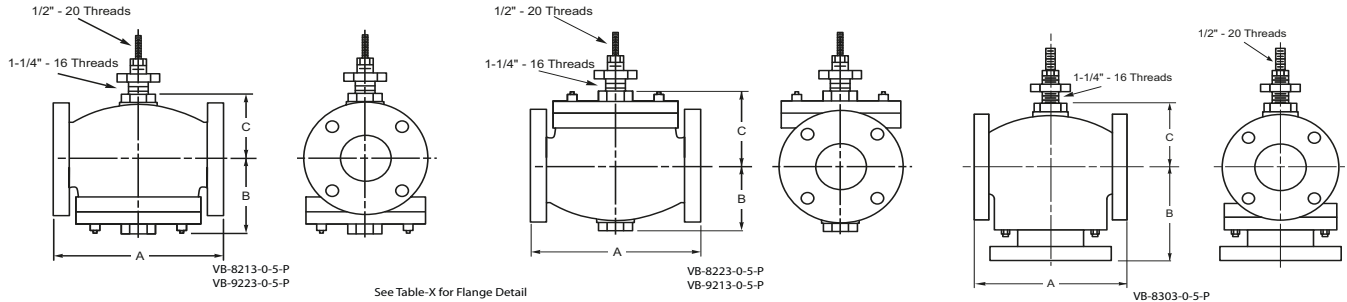
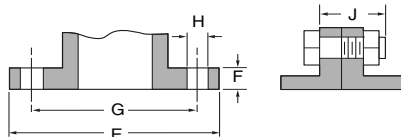


Figure-1 NSR Forta Actuator Dimensions



Flange Dimensions



Nominal Pipe Size	Flanges		Drilling		Bolting		Length of Machine Bolts J
	Flange Diameter E	Flange Thickness F	Diameter of Bolt Circle G	Diameter of Bolt Holes H	Number of Bolts	Diameter of Bolts	
2-1/2	7"	11/16"	5-1/2"	3/4"	4	5/8"	2-1/2"
3	7-1/2"	3/4"	6"				
4	9"	15/16"	7-1/2"	7/8"	8	3/4"	3"
5	10"	15/16"	8-1/2"				
6	11"	1"	9-1/2"				3-1/4"

Figure-2 VB-8xxx and VB-9xxx Valve Body and Flange Dimensions

**Table-8 VB-8xxx Dimensions** (see Figure-1 and Figure-2)

Valve Body Part Number	Size, Inches	Dimensions in Inches (mm) <sup>a</sup>			
		A	B	C	D <sup>b</sup>
VB-8213-0-5-P	2-1/2	8-9/16 (217)	4 (102)	3-3/8 (86)	13.96 (355)
	3	9-1/2 (241)	4-5/8 (117)	3-3/4 (95)	14.34 (364)
	4	11-1/2 (292)	5-1/2 (140)	4-1/2 (114)	15.09 (383)
	5	13 (330)	6-15/16 (176)	5-13/16 (148)	16.4 (417)
	6	14 (356)	7-1/2 (191)	9-3/16 (233)	19.78 (502)
VB-8223-0-5-P	2-1/2	8-9/16 (217)	4 (102)	3-11/16 (94)	14.59 (371)
	3	9-1/2 (241)	4-1/4 (108)	4-1/16 (103)	14.84 (377)
	4	11-1/2 (292)	4-15/16 (125)	5-5/16 (135)	15.53 (394)
	5	13 (330)	5-7/16 (138)	6-11/16 (170)	16.03 (407)
	6	14 (356)	6-1/4 (159)	10-3/8 (264)	16.84 (428)
VB-8303-0-5-P	2-1/2	8-9/16 (217)	5-7/16 (138)	3-1/16 (78)	16.03 (407)
	3	9-1/2 (241)	6-3/8 (162)	3-11/16 (94)	16.96 (431)
	4	11-1/2 (292)	8-7/16 (214)	4-5/16 (110)	19.03 (483)
	5	13 (330)	8-13/16 (224)	5-5/8 (143)	19.4 (493)
	6	14 (356)	9-3/4 (248)	9 (229)	20.34 (517)

<sup>a</sup> See Figure-2 for flange dimensions

<sup>b</sup> Assembly height, centerline of valve body to top of actuator (see Figure-1). Leave an additional 3" (76 mm) clearance for cover removal.

**Table-9 VB-9313 Dimensions** (see Figure-1 and Figure-2)

Valve Body Part Number	Size, Inches	Dimensions in Inches (mm) <sup>a</sup>			
		A	B	C	D <sup>b</sup>
VB-9313-0-5-P	2-1/2	8-9/16 (217)	5-3/8 (137)	3-1/2 (89)	14.09 (358)
	3	9-1/2 (241)	6-3/8 (162)	3-3/4 (95)	14.34 (364)
	4	11-1/2 (292)	8-1/2 (216)	4-1/2 (114)	15.09 (383)
	5	13 (330)	8-3/4 (222)	5 (127)	15.59 (396)
	6	14 (356)	9-3/4 (248)	5-7/8 (149)	16.46 (418)

<sup>a</sup> See Figure-2 for flange dimensions.

<sup>b</sup> Assembly height, centerline of valve body to top of actuator (see Figure-1). Leave an additional 3" (76 mm) clearance for cover removal.