

VFF1, VFF2, VFF3, VFF6 Resilient Seat Butterfly Valves with Flanged Connections

PRODUCT DATA



APPLICATION

The VFF1/VFF2 two-way and VFF3/VFF6 three-way flanged, resilient-seated butterfly valve assemblies provide compact, two-position and modulating control of hot water and chilled water-glycol solutions in heating, ventilating, and air conditioning (HVAC) systems. Valves sizes range from 2 to 20 inches. Valves with full-cut disks provide up to 175 psi close-off.

These valve assemblies are shipped with factory-mounted electric or pneumatic actuators with a variety of control signal inputs. VFF2 two-way bodies are also available as non-actuated models with either lever or gear manual operators for use as shut-off and balancing valves.

Spring-return actuators are available in normally open (VFF1) or normally closed (VFF2) two-way configurations.

Three-way valve assemblies consist of a pair of 2-way valve bodies with a common actuator mounted on a standard, iron pipe Tee. Either A-B-AB porting (VFF3) or A-AB-B porting (VFF6) is available. The A-port is factory-set to the normally closed position, but the linkage assemblies are field-adjustable to seven other configurations.

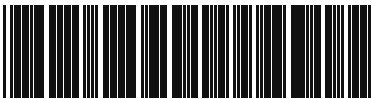
FEATURES

All Models

- Sizes from 2 to 20 inches with ANSI Class 125/150 lug pipe connections.
- Bi-directional flow.
- Modified equal percentages flow characteristic.
- Extended neck for 2 inches of pipe insulation.
- Nylon 11-coated, cast iron disks for corrosion resistance, reduced friction and use of lower-torque actuators with larger valves body sizes.
- Cast iron valve body polyester-coated for weather, chemical, ultra-violet, abrasion, and impact protection.
- Stainless steel valve stem with close-tolerance internal double-D disk connection with no points for corrosion access.
- Peroxide-cured EPDM resilient valve seat doubles as flange gasket.
- Bubble-tight seat leakage at rated close-off.
- Close-off rating of 175 psid in sizes 2 in. to 12 in. with full-cut disks.
- Close-off rating of 150 psid in sizes 14 in. to 20 in. with full-cut disks.
- 250 psi end-of-line close-off pressure rating with non-automated valves.
- 50 psid close-off rating, lower operating torque with undercut disks.
- ISO 5211 actuator mounting flange.
- Available with four, factory-installed electric actuation interfaces in 24V and 120V power: 2-position spring return, Floating (“tri-state”), Modulating (2-10 Vdc), Modulating/ Floating Spring Return.
- Actuators available in NEMA 2 (general purpose), NEMA 4X (watertight/corrosion-resistant), and NEMA 4 (watertight) enclosures.
- Anti-condensate heaters standard with NEMA 4X and NEMA 4 actuators.
- Declutchable override handwheel standard with NEMA 4X actuators.
- Non-declutchable, override handwheel standard with NEMA 4 actuators.

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- Available with six, factory-installed pneumatic actuation interfaces in low or high air pressure: 2-position spring return, 2-position bidirectional, proportional spring return, proportional bidirectional, positioner spring return, and positioner bidirectional.
- Available with three, factory-installed high pressure electro-pneumatic interfaces in spring return and bidirectional configurations: 24 Vac solenoid, 120 Vac solenoid, and modulating input, available position status indicator switches.

Two-Way Valves (VFF1/VFF2)

- Normally-open configuration (VFF1 spring return).
- Normally-closed configuration (VFF2 spring return).
- Non-automated valves available with choice of manual lever or gear operators.

Three-Way Valve Assemblies (VFF3/VFF6)

- Mixing or diverting control.
- Standard right-angle cast-iron pipe T.
- Globe valve A-B-AB flow pattern (side B port) through VFF3.
- Ball valve A-AB-B flow pattern (end B port) through VFF3.
- A-port configured to closed position at factory.
- Porting pattern field-configurable with valve linkage adjustment.

Related Literature

- 63-9683 Quick Selection Guide
- 63-9271 Damper, Actuator, Valve catalog

SPECIFICATIONS

NOTE: All specifications were accurate at time of publication. Honeywell reserves the right to improve or discontinue products without prior notification. To obtain the latest technical literature, please consult the ECC website at <http://customer.honeywell.com>.

Models: See Table 1

Dimensions: See Figures 1-11

Mounting: Bolt holes conform to ANSI B16.1, Class 125/150. See Table 1 for models.

Body Style:

Two-way lugged butterfly valve, straight-through flow, full or undercut disk.

Three-way ball valve, A-B-AB or A-AB-B flow pattern, full or undercut disks.

ANSI 125/150 flanged connections. See Fig. 12.

Operating Torque: See Fig. 14

Body Size: 2 in. to 20 in.

Flow Characteristics:

Modified equal percentage up to 60° stem rotation. (See Fig. 13.)

Body Static Pressure Rating (maximum):

Automated valves: 175 psid (1206 kPa) at 250 °F (121 °C).

Manual valves, 2 in. to 20 in.: 250 psid (1725 kPa) at 250 °F (121 °C).

Operating (seating/unseating) Torque: See Figure 14
Close-Off Pressure Rating (maximum differential):

Automated Valves

2 in. to 12 in.:

175 psid (1206 kPa) at 250 °F (121 °C).

End-of-line service without downstream flange:

75 psid (517 kPa).

14 in. to 20 in.:

150 psid (1034 kPa) at 250 °F (121 °C).

End-of-line service without downstream flange:

50 psid (345 kPa).

High pressure, bi-directional pneumatic: 175 psid (1206 kPa) at 250 °F (121 °C).

4 in. to 20 in., undercut disk: 50 psid (345 kPa) at 250 °F (121 °C).

NOTE: undercut models are not suitable for dead end service without mating downstream flange.

Manual Valves (oversize disc)

2 in. to 20 in.: 250 psid (1725 kPa) at 250 °F (121 °C) without downstream flange.

Controlled Media:

Water or Glycol solutions up to 50% concentration.

Not suitable for combustible gases or steam.

Temperature range: -40 °F to 250 °F (-40 °C to 121 °C).

Velocity limits for on-off service:

Fluids: 30 fps (9 m/s),

Gases: 175 fps (54 m/s)

Materials:

Body: Cast iron, polyester-coated ASTM A126 Class B.

Disk: Ductile iron, Nylon™ 11 coated, ASTM A536 Grade 65-45-12.

Stem: 416 Stainless steel, ASTM 582 Type 416.

Seat: EPDM, food-grade.

Stem Seals: heavy duty acetal bushing, double-U cup seal, and thrust washer.

Approvals/Standards:

Close-off: Bubble-tight design.

Honeywell NEMA 2 Direct-Coupled Actuators: UL C/US; UL873 Plenum Rating, File N. E4436; Guide No. XAPX; CE; C-TICK.

Industrial-grade NEMA 4X Electric/Electronic Actuators: UL Listed, CSA Certified, CE.

Industrial-grade electro-pneumatic solenoids and transducers: UL Listed, CSA Certified, CE.

CRN: special order. Contact Honeywell product management.

RoHS/WEEE Compliance: not applicable

Actuator Ambient Temperature Ratings:

Electric actuators: See Table 2

Low pressure pneumatic actuators: -20 °F to 150 °F (-29 °C to 66 °C)

High pressure pneumatic actuators: -40 °F to 200 °F (-40 °C to 95 °C).

Accessories:

VFF50-0400 auxiliary switch kit for high pressure pneumatic actuators

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number. If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Environmental and Combustion Controls Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
1985 Douglas Drive North
Minneapolis, Minnesota 55422-4386
3. <http://customer.honeywell.com> or <http://customer.honeywell.ca>

International Sales and Service Offices in all principal cities of the world. Manufacturing in Belgium, Canada, China, Czech Republic, Germany, Hungary, Italy, Mexico, Netherlands, United Kingdom, and United States.

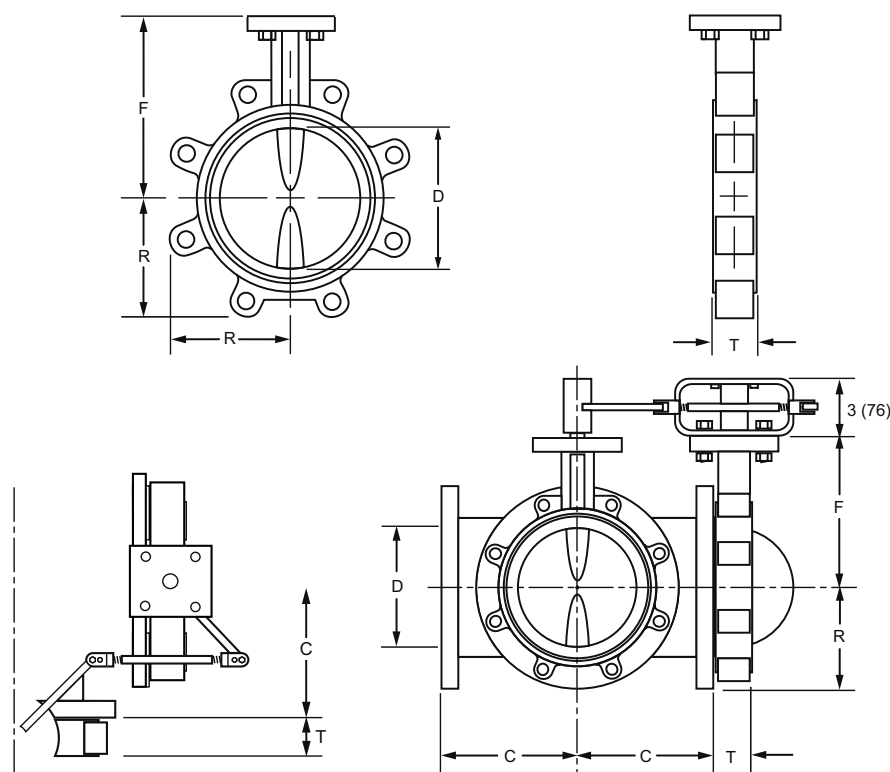
Table 1. VFF resilient seat butterfly valves model selection

Butterfly Valves	Fitting	Body Pattern	Size	Disk Size (close-off)	Pressure Rating	Valve Trim	Actuator Secondary Spec.	Actuator Primary	Description	Actuator Type
VF	Butterfly Valve, resilient seat									
	F	Flanged fitting								
		1	2-way (spring return normally open), pneumatic only							
		2	2-way (non-spring return or electric spring return DCA, factory set to normally closed, and field-convertible to normally open.)							
		3	3-way A-B-AB (mixing/diverting)							
		6	3-way A-AB-B (diverting/mixing)							
		F	2 inch (DN50)							
		G	2-1/2 inch (DN65)							
		H	3 inch (DN80)							
		J	4 inch (DN100)							
		K	5 inch (DN125)							
		L	6 inch (DN150)							
		M	8 inch (DN200)							
		N	10 inch (DN250)							
		P	12 inch (DN300)							
		R	14 inch (DN350)							
		S	16 inch (DN400)							
		T	18 inch (DN450)							
		U	20 inch (DN500)							
		V	Undercut disk (lower actuator torque; 50 psid close-off)							
		W	Full diameter disk (high close-off)							
		1	Maximum 175 psi close-off pressure							
		2	Maximum 250 psi close-off pressure (manual valves only)							
		Y	Nylon-coated disk, EPDM seat							
		2	NEMA 2 actuator housing (Honeywell DCA) See fig. 2 and 3 for tandem mounting dimensions.						Electric	
		4	NEMA 4 actuator housing with manual operator and heater							
		X	NEMA 4X actuator housing with manual operator and heater							
		8	Spring Range 8-13 psi for 20 psi pneumatic actuator						Pneumatic	
		C	24 Vac solenoid for 80 psi pneumatic actuator							
		D	Electro-pneumatic positioner for 80 psi actuator							
		E	120 Vac solenoid for 80 psi pneumatic actuator							
		P	Pneumatic positioner for modulating applications							
		X	Standard, two-position control only							
		L	Lever operator for dead end service						Manual	
		G	Geared operator for dead end service							
		A	Floating actuator						Electric	
		B	Modulating actuator							
		C	Two-position 24 Vac spring return actuator							
		D	Modulating spring return actuator							
		E	Two-position 120 Vac spring return actuator							
		P	Pneumatic actuator, spring return 20 psi						Pneumatic	
		R	Pneumatic actuator, double-acting 80 psi (140 psi maximum)							
		S	Pneumatic actuator, spring return 80 psi (140 psi maximum)							
		X	Valve body only, for dead end service						Manual	

VF	F	2	J	V	1	Y	2	D	Example: 2-way, 4 inch flanged resilient-seat butterfly valve, undercut disk (50 psid close-off) modulating/floating control, spring return normally closed.	
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VFF1, VFF2, VFF3, VFF6 RESILIENT SEAT BUTTERFLY VALVES WITH FLANGED CONNECTIONS

Note: This table is intended to explain the significance of the VFF butterfly valve part numbering system, and is not a product configuration tool. Only part numbers printed in Honeywell price books may be ordered. Please contact Product Marketing for information and feasibility of custom configurations. Refer to figures 2 and 3 for tandem DCA configurations.

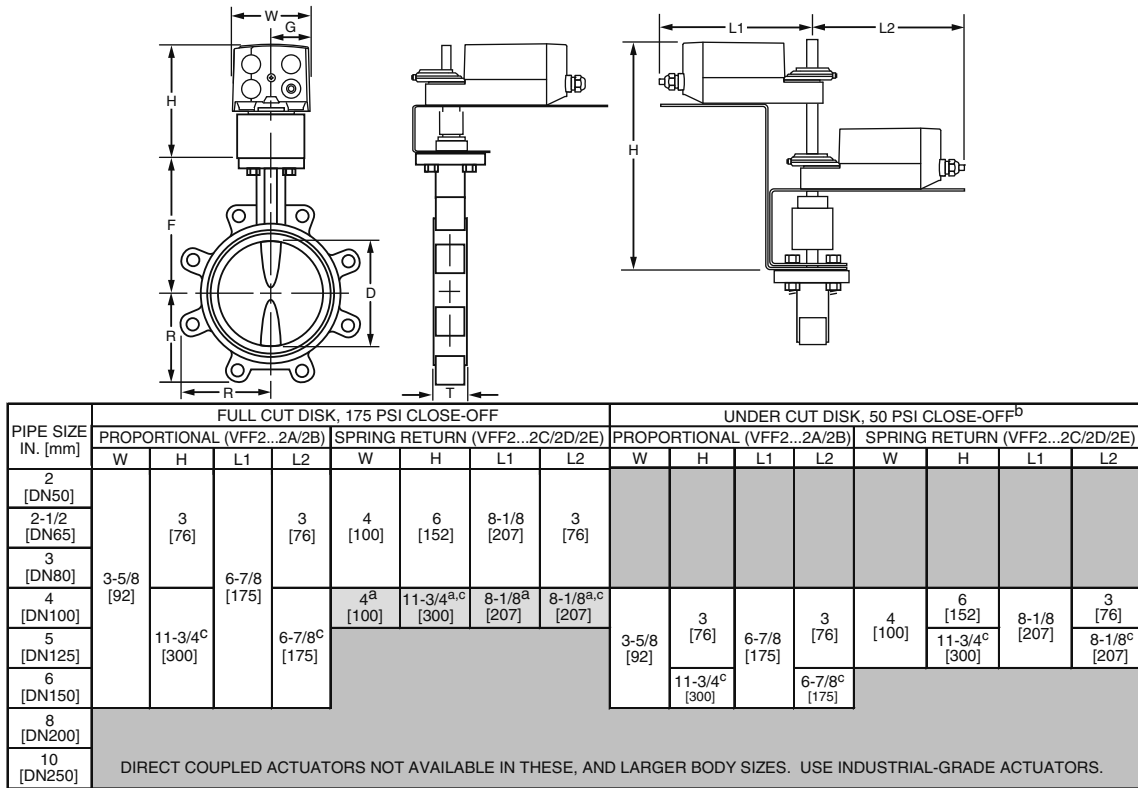


Resilient Seat Butterfly Valve, Models and Cv			Close-off Pressure, Operating Torque, lb-in. [Nm]						Flanged Valve Body Dimensions, inches [mm].																							
Pipe Size in. [mm]	Model No. 2-way / 3-way	Cv [kvs] @ 60° @ 90°	Full Cut Disk (...W1Y...) Close-off			Under Cut Disk (...V1Y...) Close-off			D I.D.	R Radius	F Neck	T Thickness	C (3-way) Face-C/L	Flange Bolts No. C/L Dia Thread																		
2"	1, 2... F...	61 144	175 psid [1206 kPa]	126 151	Only high close-off (full cut disk) models available in these body sizes																											
[DN50]	3, 6...	[53] [125]		[14] [17]													2 2-1/4 5-1/2 1-5/8 4-1/2															
2-1/2"	1, 2... G...	107 282		150 180													2-1/2 2-9/16 6 5	4	5-1/2													
[DN65]	3, 6...	[93] [244]		[17] [20]													[64] [65] [152]		[127]	[140]												
3"	1, 2... H...	154 461		180 216													3 2-3/4 6-1/4 [44]		5-1/2													
[DN80]	3, 6...	[133] [399]		[20] [24]													[76] [71] [159]	1-1/2	[152]													
4"	1, 2... J...	274 841		372 446													50 psid [345 kPa]															
[DN100]	3, 6...	[237] [727]		[42] [50]																									4 4-1/16 7 2	6-1/2	7-1/2	
5"	1, 2... K...	428 1376		468 562																									312 374 5 4-5/8 7-1/2	[51]	[165]	8-1/2
[DN125]	3, 6...	[370] [1190]		[53] [64]																									[35] [42] [127] [117] [191]	2-1/8	[191]	[216]
6"	1, 2... L...	567 1850	564 677	456 547 6 5 8	[54]	8	9-1/2																									
[DN150]	3, 6...	[490] [1600]	[64] [77]	[52] [62] [152] [129] [203]	[203]	[203]	[241]																									
8"	1, 2... M...	1081 3316	1224 1469	564 677 8 6 9-1/2	8	9	11-3/4																									
[DN200]	3, 6...	[935] [2868]	[138] [166]	[64] [77] [203] [154] [241]				2-1/2	[229]	[298]																						
10"	1, 2... N...	1710 5430	2637 3164	1128 1354 10 7-3/4 10-3/4				[64]	11	14-1/4																						
[DN250]	3, 6...	[1479] [4697]	[298] [358]	[127] [153] [254] [195] [273]		[279]	[362]	7/8-9																								
12"	1, 2... P...	2563 8077	150 psid [1034 kPa]	4132 4958																												
[DN300]	3, 6...	[2217] [6987]		[467] [560]													2074 2489 12 9 12-1/4	12	12	17												
14"	1, 2... R...	3384 10538		5864 7037													3000 3600 14 9-15/16 13-5/8				3	[76]	14									
																								[DN350]	3, 6...	[2927] [9115]	[663] [796]	[339] [407] [356] [252] [346]	[356]	[476]		
16"	1, 2... S...	4483 13966		8182 9818													3880 4656 16 11-1/4 14-3/4	16	4	15	21-1/4											
[DN400]	3, 6...	[3878] [12081]		[924] [1109]													[438] [526] [406] [287] [375]					[102]	[381]	[540]								
18"	1, 2... T...	5736 17214		10819 12983													4788 5746 18 12-3/16 16 4-1/4					16-1/2	22-3/4									
[DN450]	3, 6...	[4962] [14890]		[1222] [1466]													[541] [649] [457] [309] [406]	[108]	[419]	[578]	1 1/8-7											
20"	1, 2... U...	7144 22339		14091 16909													6243 7492 20 14 17-1/4	20	5	18		25										
[DN500]	3, 6...	[6180] [19323]		[1592] [1910]													[705] [846] [508] [356] [438]						[127]	[457]	[635]							

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Fig. 1. VFF1, VFF2, VFF3 & VFF6 butterfly valve body dimensions

VFF1, VFF2, VFF3, VFF6 RESILIENT SEAT BUTTERFLY VALVES WITH FLANGED CONNECTIONS



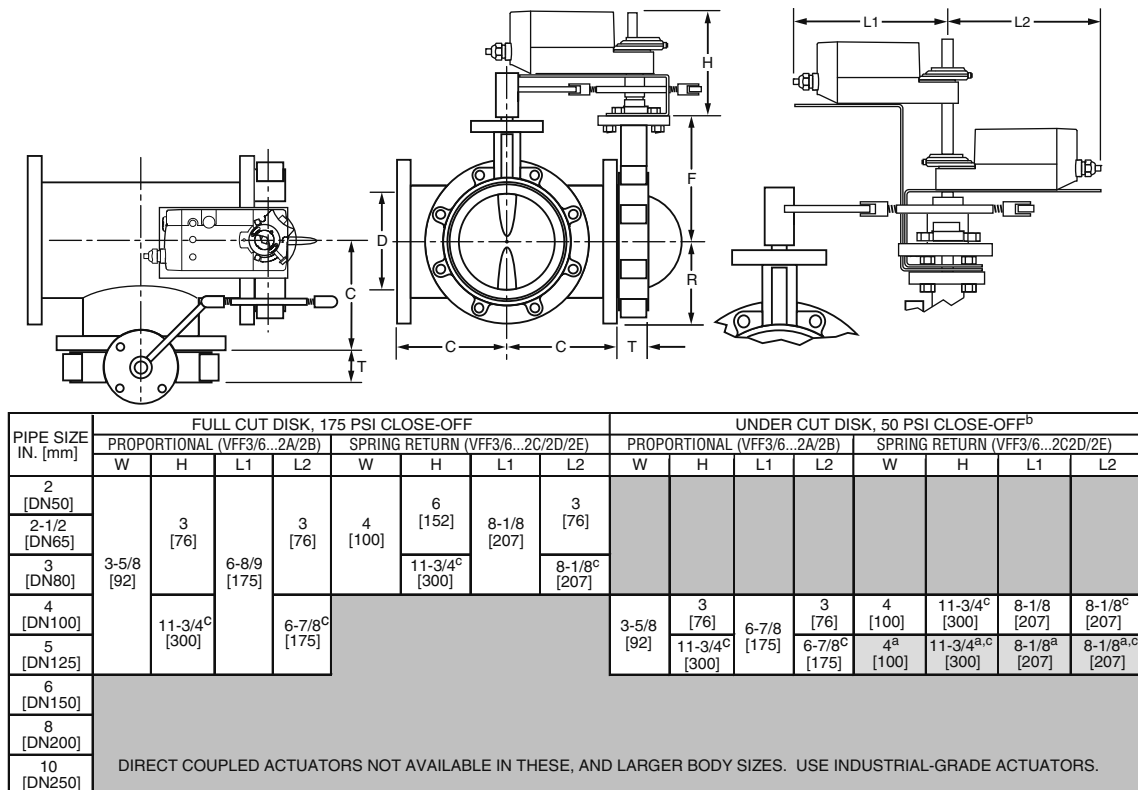
^a CHILLED WATER APPLICATION ONLY.

^b NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF AND ARE AVAILABLE ONLY WITH FULL CUT DISKS.

^c DIMENSION WITH TANDEM DIRECT-COUPLED ACTUATORS.

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Fig. 2. 2-Way VFF dimensions with NEMA 2 (Honeywell DCA) actuators Tandem Actuator orientation



^a CHILLED WATER APPLICATION ONLY.

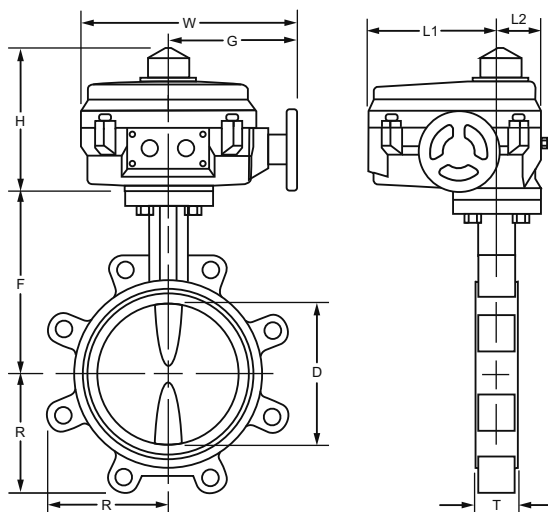
^b NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF AND ARE AVAILABLE ONLY WITH FULL CUT DISKS.

^c DIMENSION WITH TANDEM DIRECT-COUPLED ACTUATORS.

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Fig. 3. 3-Way VFF dimensions with NEMA 2 (Honeywell DCA) actuators Tandem Actuator orientation

VFF1, VFF2, VFF3, VFF6 RESILIENT SEAT BUTTERFLY VALVES WITH FLANGED CONNECTIONS



PIPE SIZE IN. [mm]	FULL CUT DISK, HIGH CLOSE-OFF* NEMA 4X (VFF2_W1YXA/B)					UNDER CUT DISK, 50 PSI CLOSE-OFF** NEMA 4X (VFF2_V1YXA/B)				
	W	H1	L1	L2	G	W	H1	L1	L2	G
2 [DN50]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [51]	5-3/4 [147]					
2-1/2 [DN65]										
3 [DN80]										
4 [DN100]										
5 [DN125]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [51]	5-3/4 [147]
6 [DN150]						10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]
8 [DN200]										
10 [DN250]	12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]
12 [DN300]										
14 [DN350]										
16 [DN400]										
18 [DN450]	NEMA 4 (VFF2_W1Y4A/4B)					12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]
20 [DN500]	8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]					
	NEMA 4 (VFF2_V1Y4A/4B)					8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]

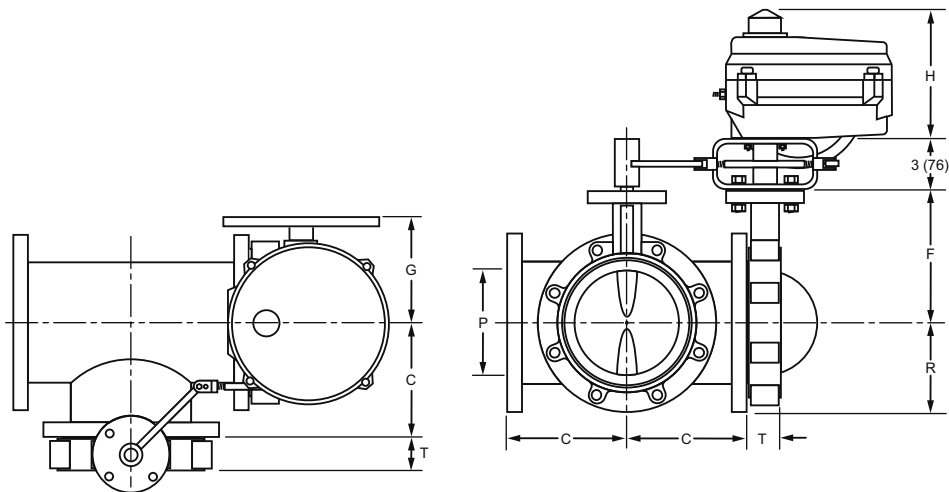
* 175 PSI [1206 KPA] CLOSE-OFF UP TO 12 INCHES [DN 300], 150 PSI [1034 KPA] OTHERWISE

**NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF AND ARE AVAILABLE ONLY WITH FULL CUT DISKS.

⚠ NEMA 4X ACTUATORS ARE WATERPROOF AND CORROSION-RESISTANT.

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Fig. 4. 2-Way VFF dimensions with NEMA 4/4X (industrial-grade) actuators

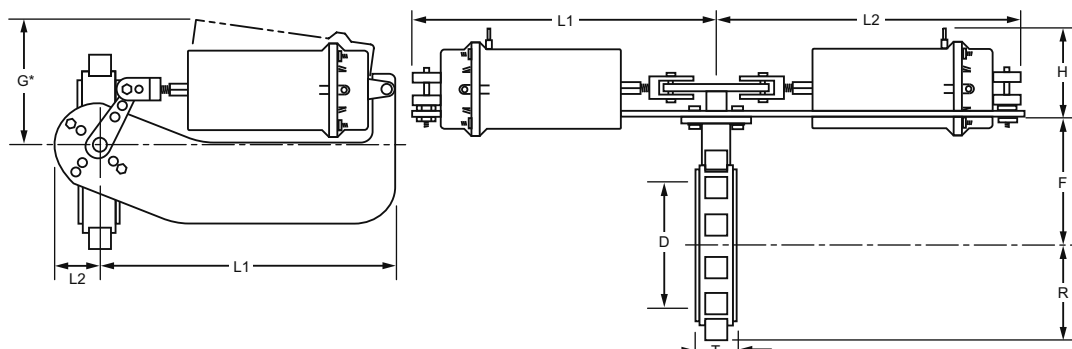


PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF NEMA 4X (VFF3/6_W1YXA/B)					UNDER CUT DISK, 50 PSI CLOSE-OFF** NEMA 4X (VFF3/6_V1YXA/B)				
	W	H	L1	L2	G	W	H	L1	L2	G
2 [DN50]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [49]	5-3/4 [147]					
2-1/2 [DN65]										
3 [DN80]										
4 [DN100]	10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]	7-1/2 [191]	6-3/4 [170]	5-1/2 [141]	2 [49]	5-3/4 [147]
5 [DN125]										
6 [DN150]										
8 [DN200]						10-1/8 [257]	8-1/8 [206]	7-3/8 [188]	2-3/4 [68]	7-3/4 [198]
10 [DN250]	12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]					
12 [DN300]										
14 [DN350]	NEMA 4 (VFF3/6_W1Y4A/4B)					12-1/8 [307]	8-3/4 [224]	8-7/8 [226]	3-1/4 [81]	9-1/2 [241]
16 [DN400]										
18 [DN450]	8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]	NEMA 4 (VFF3/6_V1Y4A/4B)				
20 [DN500]						8-1/2 [217]	16 [406]	8-3/4 [221]	4-1/2 [115]	12-1/2 [320]

* 175 PSI [1206 KPA] CLOSE-OFF UP TO 12 INCHES [DN 300], 150 PSI [1034 KPA] OTHERWISE
**NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF AND ARE AVAILABLE ONLY WITH FULL CUT DISKS.

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Fig. 5. 3-Way VFF3, VFF6 dimensions with NEMA 4/4X (industrial-grade) actuators



PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF (VFF1/2_W1Y8P/PP)					UNDER CUT DISK, 50 PSI CLOSE-OFF ^b (VFF1/2_V1Y8P/PP)				
	G	H	HP	L1	L2	G	H	HP	L1	L2 ^a
2 [DN50]	5-5/8 [144]	3-1/8 [79]	6-1/4 [160]	16 [406]	3 [76]					
2-1/2 [DN65]										
3 [DN80]										
4 [DN100]	7-1/4 [186]		10 [254]	20 [506]		5-5/8 [144]	3-1/8 [79]	6-1/4 [160]	16 [406]	3 [76]
5 [DN125]	9 [227]	6-7/8 [175]	10-1/8 [257]	22-3/4 [578]		7-1/4 [186]		10 [254]	20 [506]	
6 [DN150]						9 [227]	6-7/8 [175]	10-1/8 [257]	22-3/4 [578]	
8 [DN200]										
10 [DN250]	LOW PRESSURE ACTUATORS NOT AVAILABLE IN THESE, AND LARGER BODY SIZES.									22-3/4 ^c [578]
12 [DN300]										

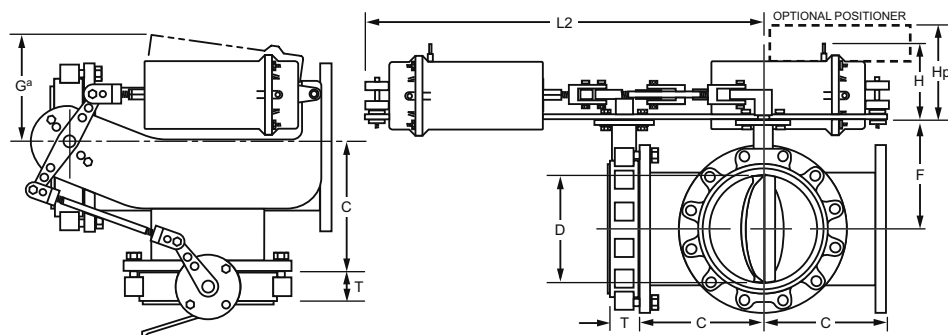
^a VALVE SIZES 2 TO 3 INCHES ARE AVAILABLE ONLY WITH FULL CUT DISKS.

^b VALVE STROKE IS LIMITED TO 70 DEGREES.

^c DIMENSION WITH TANDEM ACTUATORS.

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Fig. 6. 2-way VFF1, VFF2 dimensions with 20 psi (low pressure) spring return pneumatic actuators



PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF (VFF3_W1Y8P/PP)					UNDER CUT DISK, 50 PSI CLOSE-OFF ^b (VFF3_V1Y8P/PP)					
	G	H	HP	L1	L2	G	H	HP	L1	L2	
2 [DN50]	5-5/8 [144]	3 [79]	6-1/4 [160]	16 [406]	3 [76]						
2-1/2 [DN65]	7-1/4 [186]		10 [254]	20 [506]							
3 [DN80]	9 [227]		6-7/8 [175]	10-1/8 [257]		22-3/4 [578]					
4 [DN100]							7-1/4 [186]	10 [254]	20 [506]	3 [76]	
5 [DN125]		9 [227]					10-1/8 [257]	22-3/4 [578]			
6 [DN150]											
8 [DN200]	LOW PRESSURE ACTUATORS NOT AVAILABLE IN THESE, AND LARGER BODY SIZES.					9 [227]	6-7/8 [175]	10-1/8 [257]	22-3/4 [578]	22-3/4 ^c [578]	
10 [DN250]											
12 [DN300]											

^a NOTE: VALVE SIZES 2 TO 3 INCHES HAVE 175 PSI [1206 KPA] CLOSE-OFF ARE AVAILABLE ONLY WITH FULL CUT DISKS.

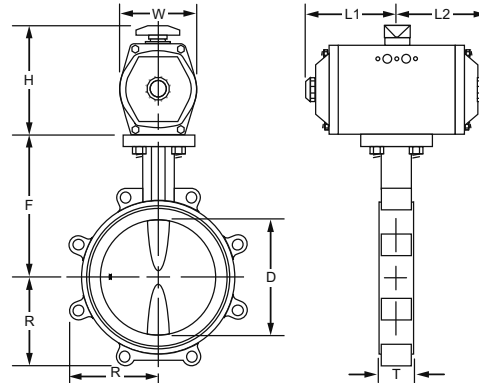
^b VALVE STROKE IS LIMITED TO 70 DEGREES.

^c DIMENSION WITH TANDEM ACTUATORS.

M31263

Fig. 7. 3-way VFF3 dimensions with 20 psi (low pressure) pneumatic actuators

VFF1, VFF2, VFF3, VFF6 RESILIENT SEAT BUTTERFLY VALVES WITH FLANGED CONNECTIONS



PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF (VFF2_W1YCR/DR/ER/PR/XR)					UNDER CUT DISK, 50 PSI CLOSE-OFF** (VFF2_V1YCR/DR/ER/PR/XR)								
	W	H	HP	L1	L2	W	H	HP	L1	L2				
2 [DN50]	2-3/4 [70]	4-1/4 [109]	10-1/4 [262]	3 [76]	3 [76]									
2-1/2 [DN65]														
3 [DN80]														
4 [DN100]	3-5/8 [91]	5-2/8 [132]	11-2/8 [284]	4 [100]										
5 [DN125]														
6 [DN150]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]	3-5/8 [91]	5-1/4 [132]	11-1/4 [284]	4 [100]	4 [100]				
8 [DN200]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]				
10 [DN250]	5-3/8 [137]	7-3/4 [196]	13-3/4 [349]	6-1/8 [157]	6-1/8 [157]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]				
12 [DN300]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]									
14 [DN350]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]				
16 [DN400]						8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]				
18 [DN450]														
20 [DN500]	10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]				

**NOTE: VALVE SIZES 2 TO 5 INCHES ARE AVAILABLE ONLY WITH FULL CUT DISKS.

M27013

Fig. 8. 2-way VFF2 dimensions with 80 psi (high pressure) pneumatic bi-directional actuators

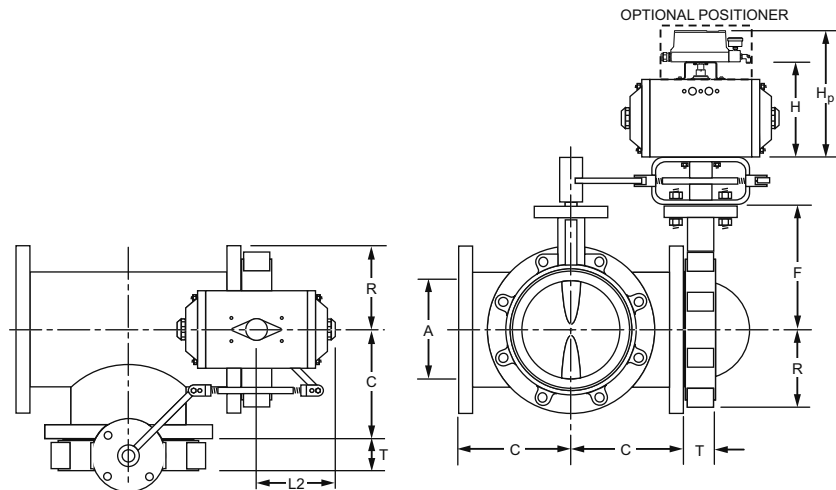
Table 2. Electric Actuator Data

Actuator Style	Torque	Control Inputs	Fail Safe	Power Supply Voltage	Current/Power	Ambient Temp.	Stroke Timing	Valve Sizes	
								2-way	3-way
NEMA 2 (Honeywell DCA)	300 in.-lb. [34 Nm]	0-10/2-10 Vdc, Floating, SPDT, SPST	Non-spring return	24 Vac/dc, 50/60 Hz	8 VA	-5 to 140 F [-20 to 60 C]	90 sec.	2 in. to 5 in. 4 in. to 8 in. (tandem DCAs)	2 in. to 4 in. 4 in. to 6 in. (tandem DCAs)
	Spring return N.C/ N.O.		24 Vac, 50/60 Hz	16 VA	-40 to 140 F [-40 to 60 C]	2 in. to 4 in. 4 in. to 5 in. ((tandem DCAs)		2 in. to 2 1/2 in. 3 in. to 5 in. (tandem DCAs)	
			120 Vac, 50/60 Hz						
NEMA 4X (Water-proof, Corrosion-Resistant)	500 in.-lb. [57 Nm]	4-20 mA dc, 0-10/2- 10 Vdc --- SP3T, SPDT	Non-Spring Return	120 Vac, 50/60 Hz	1.4 LRA ¹	-40 to 149 F [-40 to 65 C]	30 sec. modulating	2 in. to 5 in.	
	800 in.-lb. [90 Nm]				2.1 LRA ¹			5 in. to 10 in.	4 in. to 10 in.
	1,200 in.-lb. [136 Nm]				3.0 LRA ¹			10 in. to 18 in.	10 in. to 16 in.
	2,000 in.-lb. [136 Nm]								
	3,000 in.-lb. [339 Nm]								
	5,000 in.-lb. [565 Nm]								
	6,500 in.-lb. [735 Nm]								
NEMA 4 (Water-proof)	8,850 in.-lb. [1000 Nm]	4-20 mA dc, 2-10 Vdc --- SP3T, SPDT			3.2 FLA ² 10.0 LRA ¹	-21 to 149 F [-30 to 65 C]	46 sec.	14 in. to 20 in.	16 in. to 20 in.
	13,275 in.-lb. [1500 Nm]				4.0 FLA ² 10.0 LRA ¹				
	E-P Solenoid (pneumatic)				up to 29,000 in.-lb. [3277 Nm]				

¹ Locked Rotor Amps

² Full Load Amps

VFF1, VFF2, VFF3, VFF6 RESILIENT SEAT BUTTERFLY VALVES WITH FLANGED CONNECTIONS



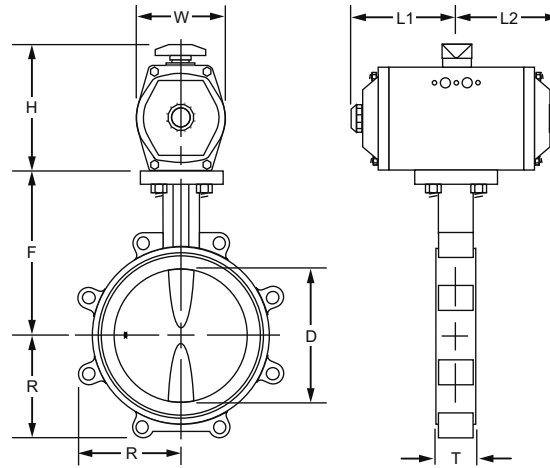
PIPE SIZE IN. [mm]	FULL CUT DISK, 175 PSI CLOSE-OFF (VFF3/6_W1YCR/DR/ER/PR/XR)					UNDER CUT DISK, 50 PSI CLOSE-OFF** (VFF3/6_V1YCR/DR/ER/PR/XR)				
	W	H	HP	L1	L2	W	H	HP	L1	L2
2 [DN50]	2-3/4 [70]	4-1/4 [109]	10-1/4 [262]	3 [76]	3 [76]					
2-1/2 [DN65]										
3 [DN80]	3-5/8 [91]	5-1/4 [132]	11-1/4 [284]	4 [100]	4 [100]					
4 [DN100]										
5 [DN125]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]
6 [DN150]										
8 [DN200]	5-3/8 [137]	7-3/4 [196]	13-3/4 [349]	6-1/8 [157]	6-1/8 [157]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]
10 [DN250]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]					
12 [DN300]										
14 [DN350]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]
16 [DN400]										
18 [DN450]										
20 [DN500]	10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]

**NOTE: VALVE SIZES 2 TO 4 INCHES ARE AVAILABLE ONLY WITH FULL CUT DISKS.

M27022

Fig. 9. 3-way VFF3, VFF6 dimensions with 80 psi (high pressure) pneumatic bi-directional actuators

VFF1, VFF2, VFF3, VFF6 RESILIENT SEAT BUTTERFLY VALVES WITH FLANGED CONNECTIONS



PIPE SIZE IN. [mm]	FULL CUT DISK, HIGH CLOSE-OFF*										UNDER CUT DISK, 50 PSI CLOSE-OFF**									
	N.O. (VFF1 V1YCS/DS/ES/PS/XS)					N.C. (VFF2 V1YCS/DS/ES/PS/XS)					N.O. (VFF1 V1YCS/DS/ES/PS/XS)					N.C. (VFF2 V1YCS/DS/ES/PS/XS)				
	W	H	HP	L1	L2	W	H	HP	L1	L2	W	H	HP	L1	L2	W	H	HP	L1	L2
2 [DN50]																				
2-1/2 [DN65]	3-5/8 [91]	5-1/4 [132]	11-1/4 [284]	4 [100]	4 [100]	3-5/8 [91]	5-1/4 [132]	11-1/4 [284]	4 [100]	4 [100]										
3 [DN80]																				
4 [DN100]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]	3-5/8 [91]	5-2/8 [132]	11-2/8 [284]	4 [100]	4 [100]	3-5/8 [91]	5-2/8 [132]	11-2/8 [284]	4 [100]	4 [100]
5 [DN125]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]	4 [100]	5-1/2 [141]	11-1/2 [293]	4-1/2 [113]	4-1/2 [113]
6 [DN150]																4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]
8 [DN200]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]	4-3/4 [120]	6-7/8 [176]	12-7/8 [328]	6 [154]	6 [154]					
10 [DN250]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]						5-3/8 [137]	7-3/4 [196]	13-3/4 [349]	6-1/8 [157]	6-1/8 [157]					
12 [DN300]						8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]	6-3/4 [172]	9-3/8 [238]	15-3/8 [391]	7-3/4 [196]	7-3/4 [196]
14 [DN350]																				
16 [DN400]	10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]						8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]	8-7/8 [224]	11-5/8 [295]	17-5/8 [447]	9-1/2 [240]	9-1/2 [240]
18 [DN450]						10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]										
20 [DN500]											10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]	10-3/4 [273]	13-1/2 [342]	19-1/2 [495]	13-3/8 [339]	13-3/8 [339]

* 175 PSI [1206 KPA] CLOSE-OFF UP TO 12 INCHES [DN 300], 150 PSI [1034 KPA] OTHERWISE.

**NOTE: VALVE SIZES 2 TO 3 INCHES ARE AVAILABLE ONLY WITH FULL CUT DISKS.

M27014

Fig. 10. 2-Way VFF1, VFF2 dimensions with high pressure, spring return pneumatic actuators

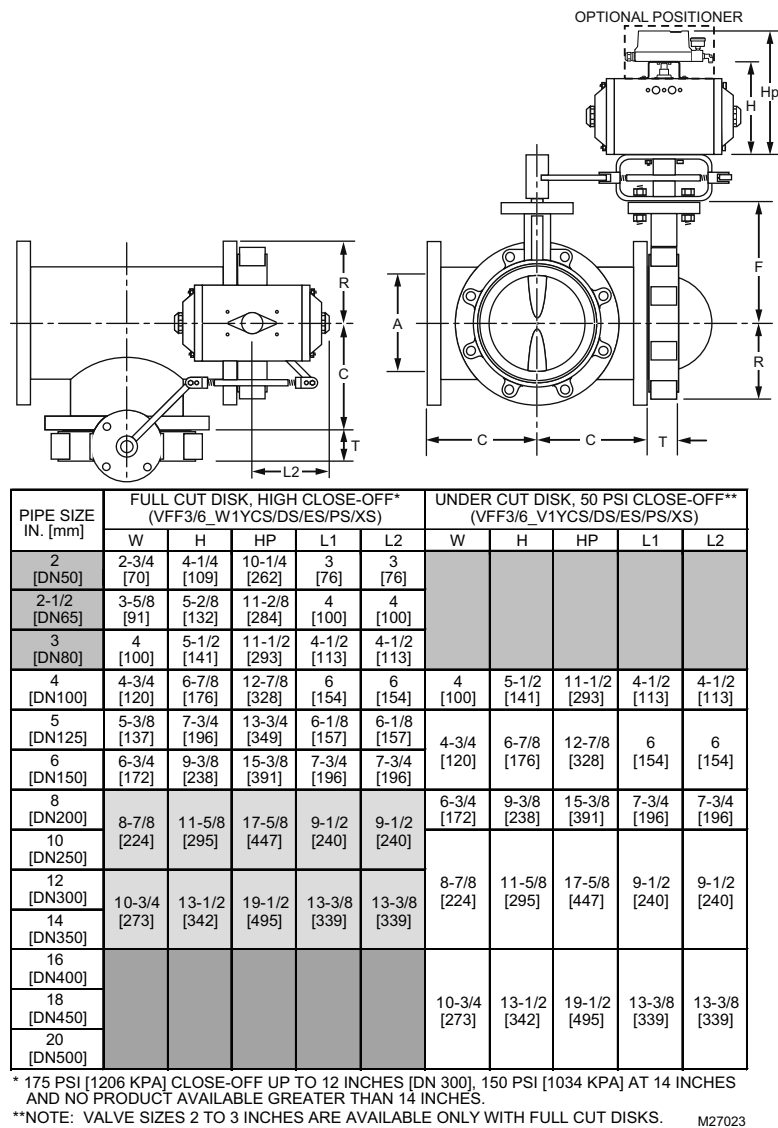
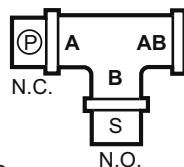
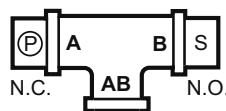


Fig. 11. 3-way VFF3, VFF6 dimensions with 80 psi (high pressure) pneumatic spring return actuators

VFF3 DEFAULT CONFIGURATION

VFF6 DEFAULT CONFIGURATION
(NOT AVAILABLE WITH LOW PRESSURE PNEUMATIC ACTUATORS)

NOTES:

P = ACTUATOR AND PRIMARY VALVE

S = SLAVE VALVE

VIEWED FROM ABOVE

VFF3 VALVE ACTION IS MIXING FOR FLUID FLOW FROM LEFT TO RIGHT.

VFF3 VALVE ACTION IS DIVERTING FOR FLUID FLOW FROM RIGHT TO LEFT.

VFF6 MAY BE PIPED FOR MIXING CONTROL WITH WATER EXITING PORT AB, OR FOR DIVERTING CONTROL WITH WATER ENTERING PORT AB. M27015

Fig. 12. VFF3, VFF6 3-Way valve assembly porting configurations

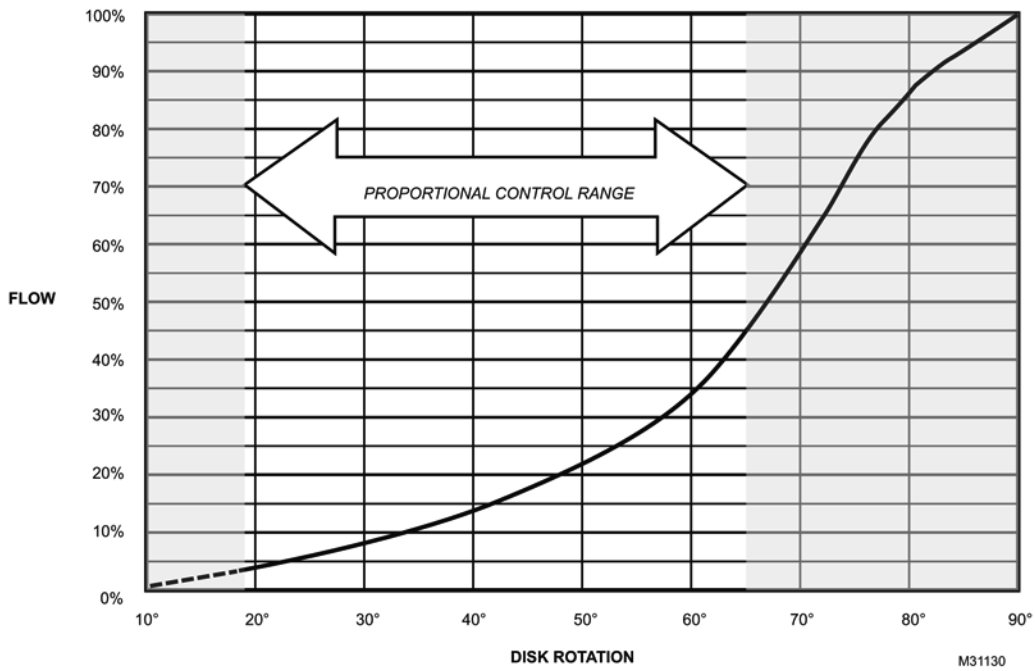
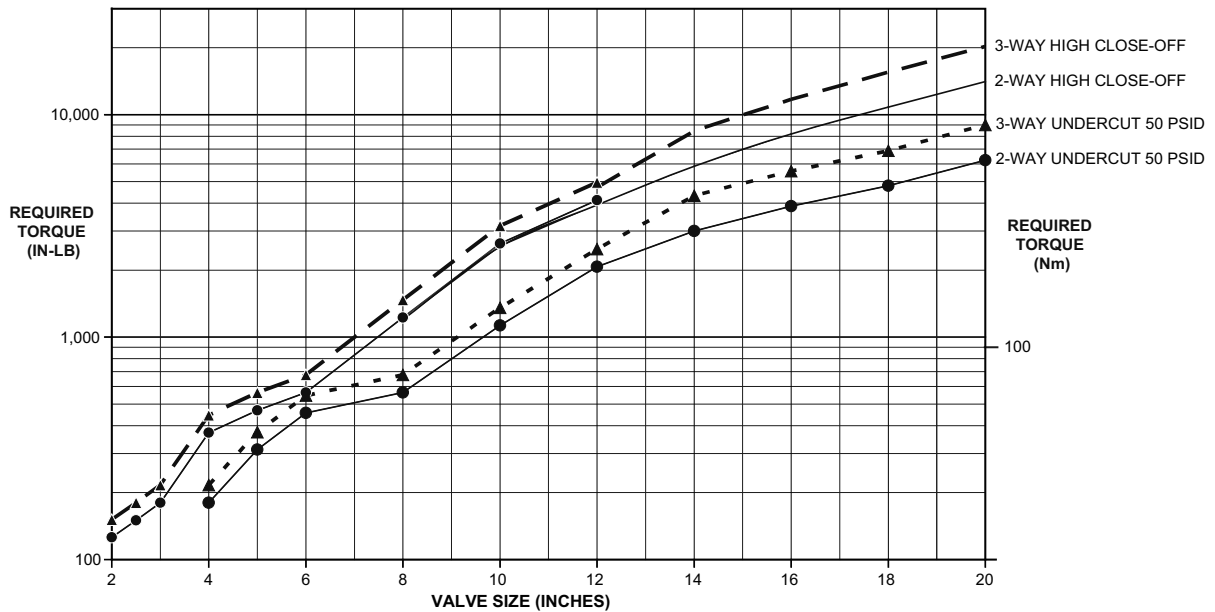


Fig. 13. Typical VFF Flow Characteristics



NOTES: FOR REFERENCE ONLY. ACTUATORS SUPPLIED MEET OPERATING TORQUE REQUIREMENTS FOR WATER-GLYCOL AND WATER CONTROL. CHART DOES NOT APPLY TO MANUAL VALVES, WHICH USE OVERCUT DISKS.

TORQUE OF PNEUMATIC ACTUATORS VARIES WITH SUPPLY AIR PRESSURE.

ACTUATOR TORQUE REDUCTION WILL REDUCE CLOSE-OFF RATINGS OF VALVES WITH FULL CUT DISK.

M27017

Fig. 14. VFF butterfly valves seating/unseating torque requirements

Once both the mechanical and electrical installations are complete:

1. Cycle the actuator to verify that the direction of rotation suits the control sequence.
2. If the rotation direction is incorrect:
 - a. For 2-position control actuators: Remount actuator on the bracket.
 - b. For floating control actuators: Reverse two control signal wires (CW/CCW).
 - c. For analog control actuators either:
 - (1) Reposition reverse/direct acting switch, or
 - (2) Remount actuator on the bracket.
3. If the control scheme requires fail-safe operation, ensure that, upon removal of power, the fail position coincides with the control sequence.
4. If the fail safe position is incorrect, remove and reinstall the actuator in the opposite orientation as follows:
 - a. Loosen the shaft coupling bolt using a 10 mm wrench.
 - b. Loosen all other mounting bolts connecting the actuator to the mounting bracket, and set aside.
 - c. Remove the actuator from the valve shaft.
 - d. Move the actuator coupling to the opposite side of the actuator, as displayed in Fig. 29.

- (1) Remove the retainer clip from the shaft coupling and set it aside for later use.
- (2) Remove shaft coupling from one side of the actuator.
- (3) Replace the shaft coupling on the opposite side of the actuator, aligning it based on the stroke labeling.
- (4) Replace the retainer clip on the shaft coupling using the groove of the coupling.
- e. reconnect the actuator to the valve mounting bracket by replacing the screws previously removed (step b).
- f. Tighten the shaft coupling bolt using a 10 mm wrench.

For detailed actuator information, see Honeywell literature:

- 63-2588: MN6134, MN7234 Product Data
- 63-2607: MS7510, MS7520, MS8110, MS8120 Product Data

TYPICAL SPECIFICATIONS

Actuated Butterfly Valve

Valve housing shall consist of polyester-coated cast iron, rated at no less than 175 [or 250] low [or line] voltage psi at 250 F. Valve housing shall have ANSI Class 125/150 flanges. Valve disk shall consist of Nylon 11 coated ductile iron disk. Aluminum, bronze, and stainless steel are also available. Valve shall have a blow-out proof stem with two EPDM O-rings. Valve shall have resilient tongue-and-groove EPDM combination valve seat and flange seal with minimum, bubble-tight close-off pressure of 50 [or 150, or 175, or 250] psi.

Valve Actuator

Electric control valve actuator shall accept analog modulating, floating (tri-state), or low [or line] voltage two-position signal as indicated in the control sequence. Pneumatic control valve actuators shall accept low pressure signal for proportional control, or 20 [or 80] psi air pressure signal for two-position control in a spring [or non-spring] return configuration. Actuators shall be provided by Honeywell. Actuator shall provide minimum torque required for full valve shutoff position. Wiring terminals shall be provided for installation to control signal and power wiring.

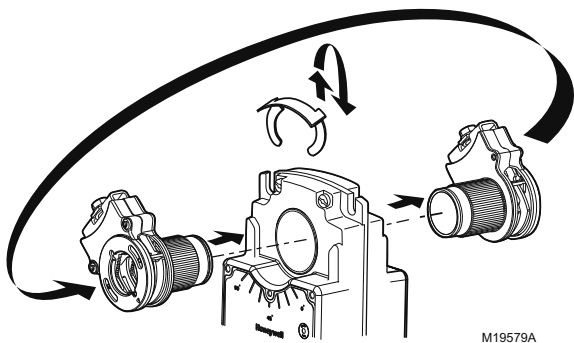


Fig. 29. DCA spring return actuator coupling to opposite side of mounting shaft

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